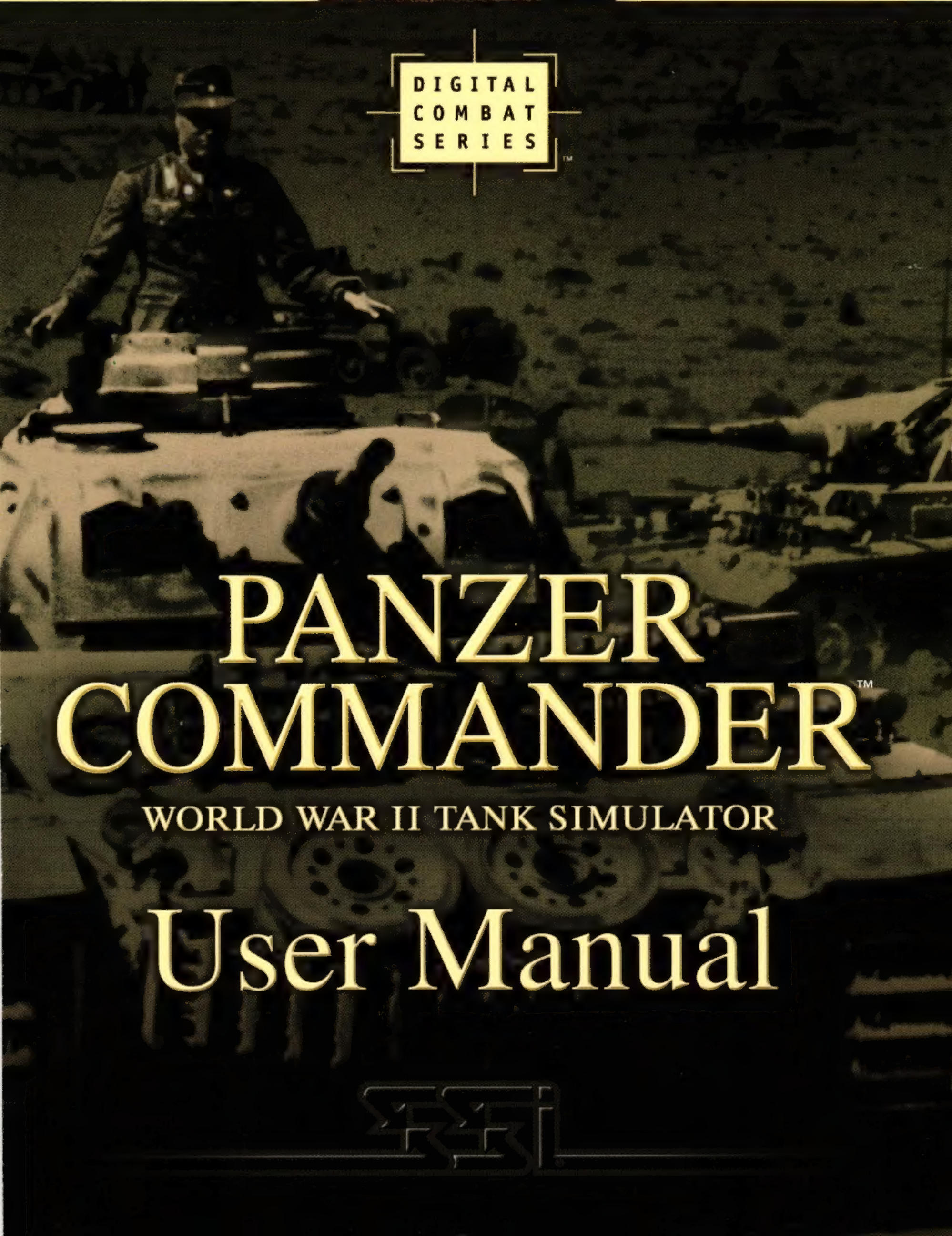

DIGITAL
COMBAT
SERIES™

PANZER COMMANDER™

WORLD WAR II TANK SIMULATOR

User Manual

PANZER COMMANDER

WORLD WAR II
TANK SIMULATOR

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On the prowl: a PzKw V Panther in Northern Europe, 1944.

INTRODUCTION

Panzer Commander is a simulation of World War II tank combat. In Panzer Commander, the attempt has been made to recreate the experience of commanding a German, Soviet, American or British tank in the European, Soviet or North African theaters. More than forty driveable vehicles are available with accurate simulations of weapon, armor, engine and crew performance. Panzer Commander also features German and Soviet campaigns developed from actual unit histories. In addition, Panzer Commander allows you to play networked multiplayer games in head-to-head or cooperative scenarios.

GETTING STARTED

To play Panzer Commander, be sure your system meets the following system requirements:

- Pentium 133 MHz IBM PC or compatible (Pentium 166 MHz recommended)
- 16 MB of RAM (32 recommended)
- Windows® 95 - *NOTE: This is a Windows 95 game and cannot be played on Windows® NT systems.* Multitasking is not recommended when playing Panzer Commander
- An Uncompressed hard drive with 130 MB free
- A 4 X CD-ROM drive or faster (8 X Recommended)
- A SVGA video adapter with 2 MB of memory and a Color SVGA Monitor
- For Accelerated Play, a 3-D accelerated card with 4MB of RAM
- A 100% Microsoft (or Logitech) compatible mouse
- Microsoft mouse driver version 9.00 or higher or Logitech mouse driver version 6.24 or higher
- 16 bit DirectX compliant sound card

In addition to the basic system requirements, the game requires that DirectX 5 be installed to your hard drive. The option to install DirectX 5 appears during the game installation. At the end of installation, you will be prompted to register Panzer Commander electronically.

For network play, you need a DirectPlay compatible network adapter.

Panzer Commander also supports hardware acceleration through Direct3D. See the section, *Playing Panzer Commander with a 3D Accelerator* on page 5 for more details.

What Comes with this Game?

Your game box should contain a Panzer Commander CD, this User Manual, and a color fold out card with hot keys and interface information.

Installing the Game

You must install Panzer Commander game files to your hard drive and have the Panzer Commander CD in your CD-ROM drive to play this game.

To install the game, insert the CD into the CD-ROM drive. When the pop-up window appears, click on the Install option. If you have disabled the Windows 95 Autorun, or if it does not function, **Explore** the CD and double-click on the Setup icon. Follow all on-screen prompts to complete the installation.

Starting the Game

Insert the Panzer Commander CD into your CD-ROM drive, and select Play from the pop-up window. For users that have disabled the Windows 95 Autorun feature, or if it does not function, open the Panzer Commander program folder from your Windows 95 Start button and click on the Panzer Commander icon. For complete and specific "how to play" information, please refer to the rest of the manual. Some changes were made too late to include in this manual. Please read the README.TXT file in your game directory for more information.

Uninstalling the Game

To uninstall the game, choose Settings from the Windows 95 Start Button, and select Control Panel. In the Control Panel, select Add/Remove Programs, left-click on Panzer Commander, and click on the Add/Remove button. The game and all of its components are then removed from your hard drive, except for your saved games or edited scenarios.

Saving Games

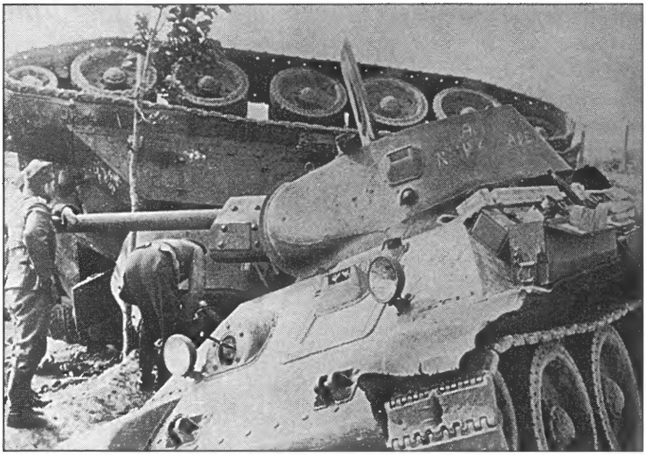
Panzer Commander requires space on your hard drive for saved games and temporary files. Each saved game can take up to 1 MB of hard drive space.

Electronic Registration

If you did not register your copy of Panzer Commander after installation and wish to do so later:

1. From your desktop select the Start button, click on Programs, click on Panzer Commander and click on Register for Free Stuff.
2. Follow all on screen prompts.

Note: *If you register electronically, or via the registration card, you will be provided with a code to unlock an additional American scenario.*



A close look at the unexpected: German officers inspecting wrecked T-34s.

Electronic Documentation

Included on the game CD is an information document, *Histories of German and Soviet Tank Divisions During World War II*, chronicling the actual careers of several German and Soviet tank units. These real life events are the basis of the campaign games you can play in PANZER COMMANDER. This extensive paper is formatted as an Adobe Acrobat document for maximum readability; it can be read at your computer, or printed out if you have a printer.

If you do not already have the Adobe Acrobat Reader, insert the PANZER COMMANDER CD into the CD-ROM drive and select ACROBAT from the pop-up window. If you have Autorun diables, go the directory where the game was installed, open the ACROBAT folder, and double-click on the file entitled Ar32e301.exe. Follow the on-screen prompts.

Once Acrobat Reader is installed on your system, you can read *Histories of German and Soviet Tank Divisions During World War II* by choosing PANZER COMMANDER from the Programs panel of your Windows 95 **Start** menu and selecting Read History File. Or, from the File menu of Adobe Acrobat, you may open the document, whose file name is HISTORY.PDF and which is located in the root directory of your game CD.

■ TROUBLESHOOTING

This section provides information that should help you solve some common problems.

Sound and Video Cards

Some sound and/or video cards are not supported by Windows 95 and DirectX. If you do not have one of the following Sound or Video cards, the game may not work.

DirectX Supported Sound Cards: *Aztech, Creative Labs, ESS*

DirectX Supported Video Cards: *2D: ATI, Cirrus Logic, Matrox, S3, Tseng Labs, Western Digital, 3Dlabs, ATI, Creative Labs, Rendition*

DirectX Supported 3D Accelerator Cards: *3DFX Voodoo or Voodoo RUSH, Monster 3D, nVIDIA RIVA 128, ATI Rage Pro, 3D Labs Permedia 2, Rendition Verite V2100 or V2200.*

DirectX 5 Setup

This game requires DirectX 5. If you do not have DirectX 5, then it can be installed from the CD. **Explore** the game CD, and open the REDIST folder. Double-click on Setup to start the DirectX 5 install.

DirectX Disclaimer

Panzer Commander utilizes Microsoft's DirectX sound and video drivers. DirectX is a programming tool created by Microsoft, and the installation of DirectX may cause video problems and system anomalies with computers using video drivers that aren't DirectX compliant. DirectX is a Microsoft product, and as such, SSI cannot be responsible for changes that might occur to your computer system due to its installation. For DirectX related problems that cannot be fixed by updating to your video card's latest Windows 95 driver set, you must contact either Microsoft or the manufacturer of your video card for further technical support or service.

Microsoft retains all intellectual property rights to DirectX. The user has been granted a limited license to use DirectX with Microsoft operating system products.

Verifying DirectX Video / Sound Card Drivers

To verify that your sound and video drivers are DirectX 5 certified, follow the steps below.

1. Click on the windows Start button (usually found in the lower-left corner of your screen).
2. Click on Run.
3. In the open field type the command: `C:\progra~1\directx\setup\dxsetup.exe` then click on OK.
4. Make sure all drivers say Certified next to them.

If any of your drivers are not DirectX certified you should contact the hardware manufacturer and see if they have certified DirectX 5 drivers.

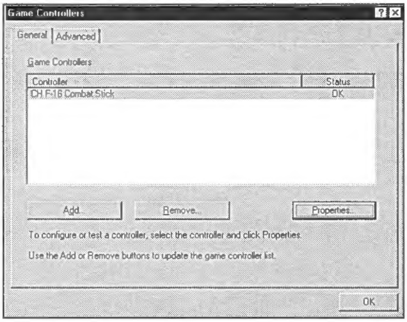
Reinstating Windows 95 Video Drivers

If you find that there is a problem with your display after you have installed DirectX 5 you can reinstate your old video drivers by following the instructions below.

1. Click on the windows Start button (usually found in the lower-left corner of your screen).
2. Click on Run.
3. In the open field type the command: `C:\progra~1\directx\setup\dxsetup.exe` then click on OK.
4. Click on the Restore Display Drivers button.

This may require that you have the disk containing your original drivers.

Using a Joystick in PANZER COMMANDER



Controller	Status
CH F-16 Combat Stick	OK

To configure or test a controller, select the controller and click Properties.

Use the Add or Remove buttons to update the game controller list.

Thrustmaster and *CH* joysticks are fully supported by PANZER COMMANDER. Other types of joysticks, throttles and foot pedals can be used if they are properly configured for Windows 95. To check if your controller is configured, open up the Control Panel, and select either the Joystick or Game Controllers icon. If your device is listed under Controllers it should work in PANZER COMMANDER. If your game controller does not appear on this list, you can attempt to configure it for Windows 95 following these instructions:

1. Connect your joystick to the game port.
2. Open up the Control Panel in Windows 95 and select the Joystick or Game Controllers icon.
4. Click on the Add button.
5. Select the style and manufacturer of your joystick or game controller if present.
6. If your controller is not on the list press the Add Other button and search the list for your model. If your model came with driver/configuration software, insert the disk and click on the Have Disk button.
7. When it returns you to the Controller screen, highlight your joystick and press the Properties button to configure it. Follow the on screen directions to establish proper configuration of the x and y axes and any special controls.

If you can't configure your joystick properly in Windows 95, you need to contact the manufacturer of your controller for further technical support. The joystick will not function properly in PANZER COMMANDER if it is not first properly configured in Windows 95.

Playing PANZER COMMANDER *with a 3D Accelerator*

PANZER COMMANDER supports 3D hardware acceleration using Direct3D. If you have a hardware accelerator, be sure that it supports Direct3D and that you have the latest drivers.

While PANZER COMMANDER supports the widest possible range of 3D accelerators, no one can anticipate every conceivable hardware configuration. If you should experience problems, contact the manufacturer of your 3D accelerator for troubleshooting information. Again, make sure that you have the latest drivers before proceeding.

For best results, an accelerator based on one of the following chip sets is recommended:

3DFX Voodoo or Voodoo RUSH, nVIDIA RIVA 128, ATI Rage Pro, 3D Labs Permedia 2, Rendition Verite V2100 or V2200.

Prepare for Battle: KV-1 crew rushes to man their tank, 1942

If you have an accelerator based on a different chip set, there is no guarantee of compatibility or good performance with PANZER COMMANDER. However, the program attempts to use any Direct3D-compatible hardware that you have. If you have problems launching the program, you can disable hardware acceleration by using the Notepad program to edit the file PANZER.INI, located in the folder where PANZER COMMANDER was installed. Change the line which reads: `Accel = TRUE` to read: `Accel = FALSE`

PANZER COMMANDER then uses its built-in software renderer. You can also enable or disable 3D acceleration using the Game Options Menu. If your machine performance is slow, you can disable certain graphics options from this screen. For more information, see *Level of Details Settings* on page 25, and *3D Accelerator Settings* on page 30.

Contacting SSI Technical Support

If you are having problems, please consult the *Troubleshooting* section of this manual before contacting SSI Technical Support. We've put many of the solutions to the most common problems in this area. If you are sure that you meet the PANZER COMMANDER'S system requirements and the game still does not run, please make certain that you are using the latest drivers for your system.

We have a staff of Technical Support Specialists ready to help you with any technical problems you may have with any of our games. If your problem is due to your system configuration they can suggest some possible solutions.

Because of the millions of different hardware and software configurations possible with today's PCs, you may still have to consult with your computer dealer, hardware manufacturer, or software publisher to properly configure your system before our game will work. You may also need to get the latest version of your sound, video, mouse, or CD-ROM drivers before the game will run properly.

We suggest contacting SSI Technical Support via fax or e-mail if possible. Please send a printout of your `c:\autoexec.bat` file, a printout of your `c:\config.sys` file, and a complete description of the problem. Please include the operating system you are using, and any error messages you have seen which indicate that there is a problem.

Please send this information to our fax number, or the e-mail address found below.

Fax: (415)895-2113 *Attn: Technical Support*

E-mail: *ssitechsupt@mindscape.com*

If you cannot fax or e-mail us, we can also be reached by phone. Our Technical Support number is (415) 895-2626. The phones are open from 8:30AM to 5PM Pacific Time, Monday through Friday (holidays excluded). **Absolutely no game playing hints will be given through this number.**

If the game about which you are inquiring has been out for more than 90 days, you'll also want to visit out website to be sure you are running the latest version of the game before contacting SSI Technical Support. The SSI website is located at *www.ssionline.com.* PANZER COMMANDER also has its own website at *www.panzercommander.com.*

■ TUTORIALS

The easiest way to become familiar with the interface, game play, and tactics of PANZER COMMANDER is to run through the tutorial scenarios that have been created. Both tutorials are accompanied by step-by-step explanations, which walk you through the scenarios. The first describes how to drive your tank, navigate through a mission, and operate your guns to destroy targets; the second tutorial delves into the basics of commanding a platoon of tanks and surviving against enemy tanks.

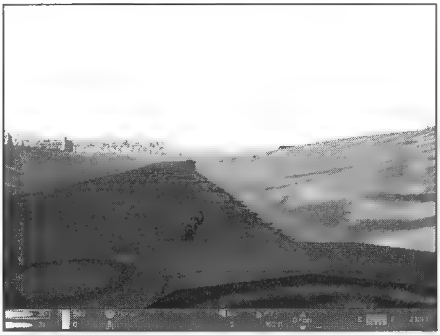
The tutorials are basically the same for all four nationalities with one important distinction: the tanks (and the range finders for aiming the main gun) are specific to that nation. The tanks therefore have different speeds, armor, etc. which can change the difficulty of the tutorial slightly. It's a good idea to check your crew and tank abilities as you start the scenario.

Training Mission 1 – Basic Tank Command

This mission scenario introduces you to the basics of driving your tank, ordering your driver, navigating to way points, and using the commander's map display.

From the Main Menu, click on Single Scenario, choose a nationality, and click on 1-Training in the scenario listing. Click on the "checkmark" button, described as Accept Chosen Scenario, to bring up the Briefing screen. You are given a brief description of the scenario, requirements for victory in the scenario, your crew's rank, the type of tank you are commanding, and the time you have to accomplish your goals. Click again on the "checkmark" button to enter the simulator.

While you are playing the tutorial, if you need to pause the game, restart the scenario, or end the scenario, press the **Escape** key. This brings up a screen which allows you to **Continue Scenario in Progress**, **Restart the Scenario** from the beginning, **End Scenario and Save Results**, or **End Scenario** and return to the Main Menu without saving.

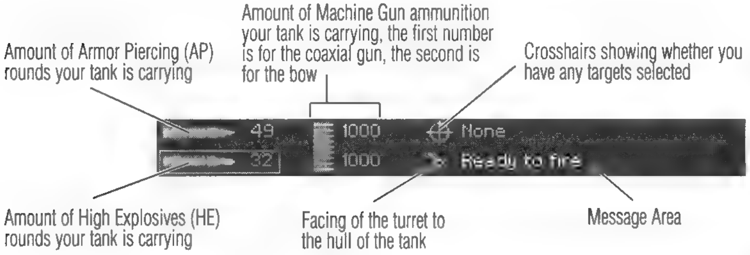


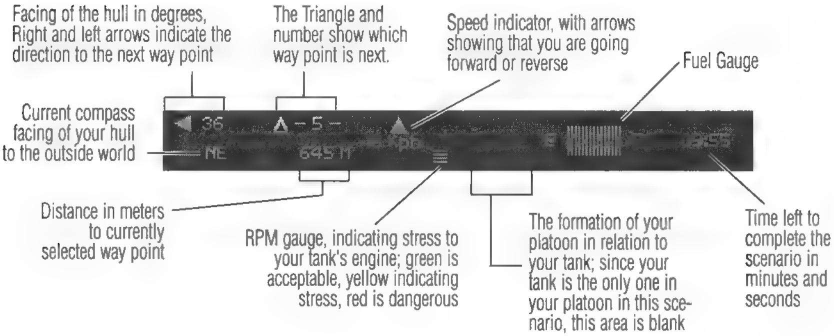
The **F2** view, Commanders Cupola view, unbuttoned

The Status Bar and Station Views

You now have command of a tank and you are standing in the turret looking out. Your tank is already moving to your first way point.

On the Status Bar at the bottom of the screen are several indicators. Learning to watch and understand these indicators is vital to game play. These indicators are described in detail in *Using the Status Bar* on page 56, however a brief description follows. The Status Bar is split into two pieces to facilitate description.


Amount of Armor Piercing (AP) rounds your tank is carrying
Amount of Machine Gun ammunition your tank is carrying, the first number is for the coaxial gun, the second is for the bow
Crosshairs showing whether you have any targets selected
49
32
1000
1000
None
Ready to fire
Amount of High Explosives (HE) rounds your tank is carrying
Facing of the turret to the hull of the tank
Message Area


Facing of the hull in degrees, Right and left arrows indicate the direction to the next way point
The Triangle and number show which way point is next.
Speed indicator, with arrows showing that you are going forward or reverse
Fuel Gauge
Current compass facing of your hull to the outside world
36
5
kph
NE
645 m
Distance in meters to currently selected way point
RPM gauge, indicating stress to your tank's engine; green is acceptable, yellow indicating stress, red is dangerous
The formation of your platoon in relation to your tank; since your tank is the only one in your platoon in this scenario, this area is blank
Time left to complete the scenario in minutes and seconds

You start each scenario from the commander's cupola view, unbuttoned, allowing you a wide range of vision, and from which you can command the other stations of your tank. You can switch through the various other views, representing the gauges and range of view available at the other stations, by pressing the function keys.

F1	External tank view. In this view the camera always points towards your tank.
F2	Commander's cupola view, unbuttoned. This is the view you would have from the commander's cupola with the hatch open and your head sticking out.
F3	Commander's cupola view, with binoculars. The view from the unbuttoned commander's cupola, seen through a pair of binoculars allowing you to see objects farther away.
F4	Commander's cupola view, buttoned up. Although your view is more constricted here, your tank commander is safer, and you are able to see the commander's map.
F5	Driver's view. This is the view you would have from the driver's seat.
F6	Gunner's view. This view provides access to the basic gunnery functions for the main gun and the coaxial machine gun. This is 2.5x magnification.
F7	Gun sight view. This is a 5x magnified gun sight which allows you to better target more distant objects for your main gun.
F8	Bow machine gun view. This view allows you to operate the bow machine gun.

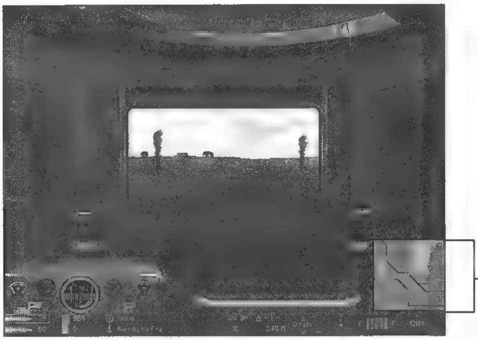
From either the **F2** or **F3** view, the **7**, **9**, **1**, and **3** on the **keypad** govern which way you are looking out from your tank. Flip through the different views, and try changing the direction you are looking. Press the **C** key to center your view.

Driving and Navigation

At the beginning of the scenario, your driver already has his orders to follow the way points. If you don't give the driver any orders, he follows the way points until the conclusion of the scenario. Your driver also notifies you verbally when you have reached the selected way point, and the message Way point Reached appears on your Status Bar. The selected way point automatically switches to the next way point.

You give orders to your driver by pressing the arrow keys on your keyboard, by joystick, or by rudder pedals if you have such devices connected to your computer. For any method, **up** orders your driver to go faster, **down** means to slow down or go into reverse if you are already stopped, **left** orders the driver to turn the tank towards the left, and **right** means turn the tank to the right. Pressing the **Delete** key orders the driver to hit the brakes and stop. Another method of setting the speed of your tank, which gives more control than the up and down arrows, is using the **number keys** on your keyboard. Press a number from 1 to 0 to set the throttle, 1 being the slowest, 0 being top speed. Pressing the ~ key sets your tank's throttle to idle, and pressing the **End** key orders your driver to reverse direction.

If you have the turret facing another direction than the way the tank is going, pressing **D** orders the driver to turn the tank's current heading to the direction you as the commander are looking. Practice increasing and decreasing your speed, and turning your tank to either side, then press **F4** to bring up the commander's cupola view, buttoned up, from which you can view the commander's map.



The **F4** view, Commanders Cupola view, buttoned

Commander's Map

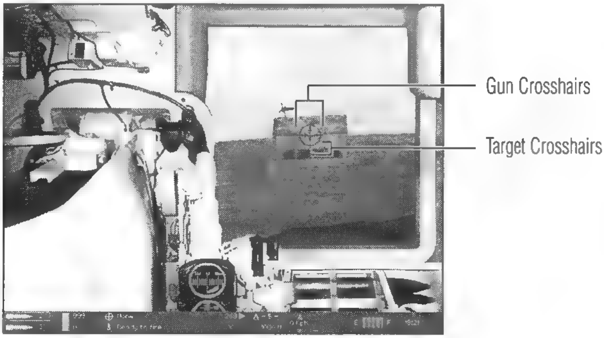
On this map are shown the terrain, roads, buildings and waypoints/mission objectives (in gold). As you may recall from the scenario briefing, your mission is to drive to the crossroads, destroy the structures there, and then clear the gun emplacements from the road to the north. Right now you need to get to the crossroads to the southwest of your position. If you follow the road you will eventually reach the crossroads. You can allow your driver to drive the tank by pressing the **A** key to order your driver to drive to the selected way point. From the commander's screen you can increase or decrease the speed of your tank, but if you move the tank from side to side, your driver relinquishes control of the tank to you. Try driving toward the next way point on your own, then relinquish control of the tank to your driver, and command the driver (by pressing the A key) to navigate to the original way point he was heading to when you took control.

After reaching way point four, take command of your vehicle by turning your tank to the south for some cross-country traveling. Way point seven is where you want to end up to complete this part of the scenario. Drive south past the forest, continuing south and around the large church. Once you reach the church, turn to your right to continue southwest until you reach the road. Once the road is reached, turn right again and follow the road towards the west. If you look at your Commander's Map, you should be getting closer to the crossroads. Continue following the road until you see some buildings. Stop at way point seven for some target practice.

Basic Weapons Training

Your next goal is to become familiar with your armament by destroying five structures, starting with a farm. To fire your main gun, press the **Spacebar** or **Joystick Button 1**. Your loader automatically chambers a round of the same type of shell just fired, and notifies you verbally when completed. To change the shell type press the **G** key. Since you started with the armor piercing (AP) shell by default, this selects the high explosive (HE) shell. If your loader has already chambered a round, he unloads the gun, and then reloads it with the next shell type. This takes extra time, and it is often better to fire the round currently in your gun at an appropriate target, then change ammunition types while your loader is loading the next round.

Press **F6** to bring up the Gunner's view. Using the arrows on the numeric keypad, you can move your turret left or right, and the barrel of the main gun up or down. Hold the **Shift** key down while moving the gun for fine control. While you are in the Gunner views (**F6** and **F7**) you can use the joystick to control the aiming of your gun. While in the **F6** or **F7** view, pressing **S** selects the target centered in the sight. By pressing **S**, two red crosshairs are displayed, you are now using the range finder. For additional information see *Using the Range Finder* on page 47, but for now, the basics will do. Move the crosshairs so that they are completely covered by the side of the barn, and line up the crosshairs with each other by pressing **Page Up** or **Page Down** (Use the regular keys, not the keypad). Once the crosshairs are lined up, place the target reticule on the target and fire your main gun by pressing the **Spacebar** or **Joystick Button 1**. You should see an explosion on the barn's side if you have aimed correctly.



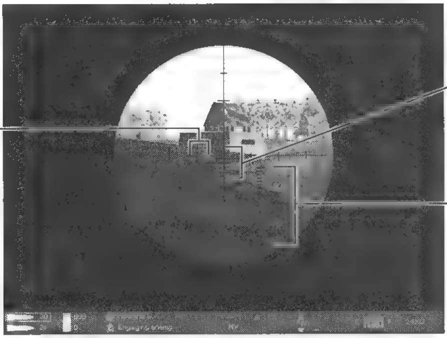
The **F6** view,
Gunner's View

Press the **F7** key to bring up the 5X power Gunner's view. Align your crosshairs with the barn, and fire your main gun again. You should see another explosion if you have aimed correctly. To fire the coaxial machine gun press down the **Left Control** key or **Joystick Button 3**. This gun uses the same targeting crosshairs as the main gun. Center the crosshairs on the barn again, and fire the coaxial machine gun. Switch to the commander's cupola view unbuttoned, and fire both guns again. You do not have to be in a gunner's screen to fire the main gun or the coaxial machine gun, but you cannot aim those guns from any other view.

The tank you are commanding also may have a bow machine gun. Press the **F8** key to switch to the Bow Gunner's view. To fire the bow machine gun you must press the **Spacebar** from within the Bow Gunner's view. This gun is targeted where the crosshairs are pointed, like the other guns. You may need to drive your tank to a different facing in order to aim your bow machine gun at the barn.

Once a structure has taken enough damage, it collapses. Rotate your turret or tank and destroy the barn and the four houses. You have accomplished your second goal.

Advanced Weapons Training

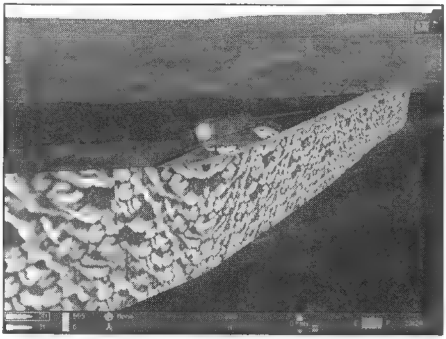


The **F7** view, Gunsight View

Now you must destroy an enemy gun emplacement that is set up to defend the road just north of the crossroads. Move northward on the road toward way point nine until the first enemy is spotted. Press the **T** key. This orders your gunner to track the currently selected enemy. If there is more than one enemy, pressing the **Tab** key repeatedly cycles through all available enemy targets. The selected target is indicated by a red or green crosshair. Press **N** to select the nearest available target and press the **Caps Lock** key to return to the previously selected target. When the gun emplacement is targeted, you can press the **E** key to order your gunner to engage the currently targeted enemy. Your gunner then fires the main gun at the target until it is destroyed. You can also switch to the Gunner's View, and fire on the enemy emplacement yourself. To center your turret and release the tracking, press **5** on the key pad.

To minimize the risk to your tank, it is best that you position the tank in a hull down location. Hull down is when the hull of your tank is not visible to the enemy; when the only part visible to your enemy is your turret. It provides the smallest target possible while still being able to fire your guns. If you are at way point nine, your tank is behind a wall, and in a hull-down position.

When the first gun emplacement is destroyed, continue down the road and engage the rest of the enemy. There are four more gun emplacements dug into this stretch of road. Because of the wider range of vision from the commander's cupola view, there may be times that you as the commander see the enemy before your gunner; if you press the **T** key, but your gunner does not acquire the target you want, your gunner can't see the target. If this happens, you can switch to the 5x power gunner's view (**F7**), target your guns, and fire on the enemy yourself. Just line up the range finder crosshairs with each other, place the target reticule on the target, and fire. Remember that if you can see the enemy, they can see you. If you hear any clanging, your tank is being hit and could be destroyed.



A good hull down location. Most of the tank is shielded by the wall, but the gun is free to fire.

To see if you have found a hull down location, press the **F1** key and use the **7**, **9**, **1** and **3** keys on the **keypad** to rotate your view so that you are in front of your tank. Most of your tank should be behind the wall, but you may wish to maneuver a bit to settle your tank in the best possible cover. When you have achieved a good hull down position, target the rest of the enemy gun emplacements, and destroy them before time runs out.

When you have completed the scenario, press **Escape** and click on the "checkmark" button to see the statistics of the mission. The Evaluation screen shows the outcome of the scenario and elapsed time. This screen also shows how many tanks, AFV, trucks, anti-tank guns, machine guns, and buildings you destroyed, and what, if anything, your side has taken in losses.

Click on the "checkmark" button at the lower-right side of the Evaluation screen to return to the Main Menu. You are now ready for the second training mission.

Training Mission 2 – Basic Platoon Command

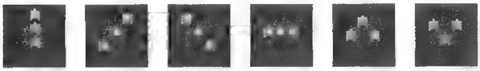
This will be your first battle against live enemy tanks whose commanders are doing their best to destroy your tank. This scenario teaches you the basics of maneuvering, flanking, and using the terrain to your advantage. You also learn how to give commands to your platoon.

From the Main Menu, click on Single Scenario, choose a nationality, and click on 2-Training in the scenario listing. Click on the "checkmark" button, described as Accept Chosen Scenario, to bring up the Briefing screen. You are given a brief description of the scenario, requirements for victory in the scenario, and the time you have to accomplish your goals. Take note of your crew rating and tank type; you may want to look up your tank in the *Tank Statistics and Capabilities* section starting on page 73. Click again on the "checkmark" button to enter the simulator.

While you are playing the tutorial, if you need to pause the game, restart the scenario, or end the scenario, press the **Escape** key. This brings up a screen which allows you to **Continue Scenario in Progress**, **Restart the Scenario** from the beginning, **End Scenario and Save Results**, or **End Scenario** and return to the Main Menu without saving.

Giving Your Platoon Orders

At the start of this scenario, you are the commander of a platoon of three tanks, so you have two additional tanks to give orders to. Although you cannot personally man the guns on the other tanks in your platoon, you can select targets for them by selecting a target, and pressing **Shift** and a number key, either **1** or **2** to assign that tank that target. Press the **V** key to change your view to the next tank in your platoon, and the **R** key to return to your tank. Press the **H** key to order your platoon to hold fire, and the **E** key to order them to fire at will on their selected targets.



Your platoon generally follows your tank, in a set formation. To give orders to your platoon to align itself in a formation press the **F** key. On the Status Bar is a diagram of where your two platoon members are supposed to form up in relation to your tank. Repeatedly pressing of the **F** key cycles through the six different formations, shown above from left to right: column, echelon left, echelon right, line abreast, wedge and crescent. For more information about the uses of the different formations, see *Changing the Platoon Formation* starting on page 53. Order your platoon into the wedge formation, for now.

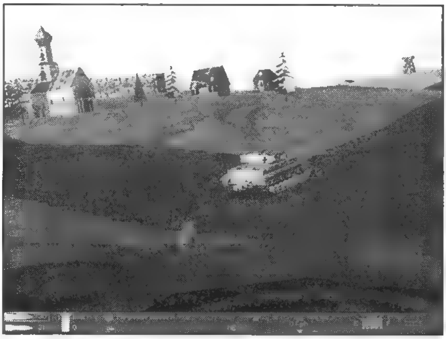
Carrying the Attack

There are several enemy emplacements and tanks awaiting you at the crossroads. If you follow the way points, you will approach the crossroads from the south and should surprise the enemy. Drive to the center of the crossroads, until your platoon members are aligned roughly straddling the crossroads, and press the **M** key to order your platoon to maintain their current position. Your platoon will now stay in their current positions to defend that important crossroads from the enemy and allow you and your tank to continue with the attack.

You must destroy all the enemy tanks to get a victory. The complexity of battle is too great to allow a step by step description of how to defeat your opponents. Keep the following concepts in mind while you are hunting your prey:

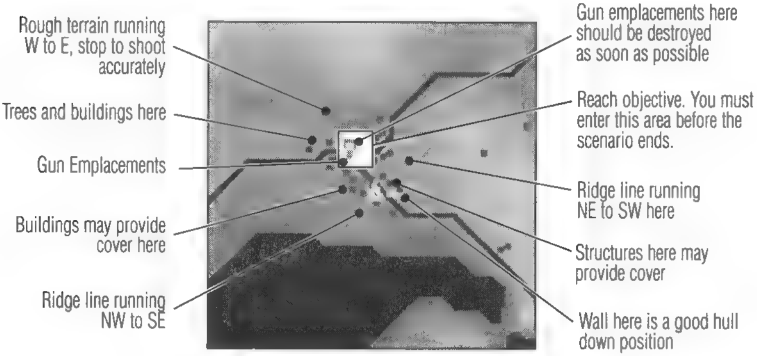
- Use your platoon members. If a particular enemy tank is giving you trouble, or seems to have a good firing position on you, order your platoon members to fire on that tank, and take some of the heat off.
- Continuously moving lessens your chance of being hit by the enemy; however, about the only time that you can fire accurately on the move is if your tank is traveling on a road. When traveling over rougher terrain, have a stable gun platform. Stop before you shoot, line up your shot, fire, and then move.
- Attack one enemy at a time. If you take on more than one enemy, the chances of your tank's destruction increases.

continued...



An excellent rear and top-down shot, achieved by coming over a ridge surrounding a road

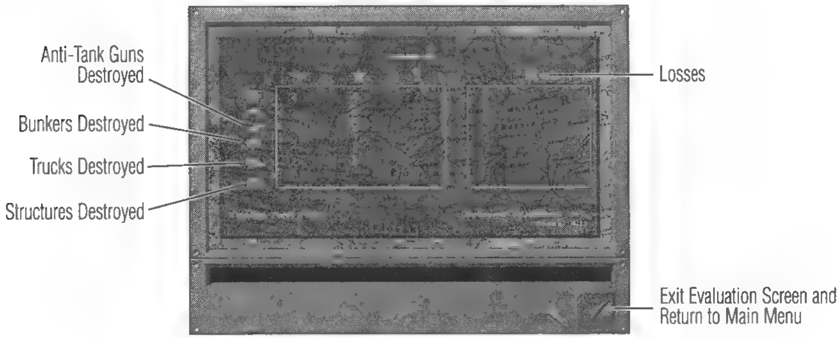
- By hitting enemy tanks in the side or rear where their armor is the thinner, you have a better chance of destroying them. Hitting them in the top is best of all, few tanks have any significant top armor.
- If you see the enemy stop, he most likely has a shot lined up and is getting ready to fire. Find cover or move erratically to spoil his aim.
- Once an enemy tank is located, maneuver for the best position. Use the **F4** key, which brings up the map of your surroundings and the location of the spotted enemy tank. Look for opportunities to move around to the side or rear of the enemy, while under cover, and places to emerge for a good shot. Finding the balance between shot selection, and protecting your own tank is a delicate art.
- Look for hull down positions. The best hull down position is behind a wall but there are ditches, river banks, hill crests, and folds in the terrain that work as well.


Rough terrain running W to E, stop to shoot accurately
Trees and buildings here
Gun Emplacements
Buildings may provide cover here
Ridge line running NW to SE
Gun emplacements here should be destroyed as soon as possible
Reach objective. You must enter this area before the scenario ends.
Ridge line running NE to SW here
Structures here may provide cover
Wall here is a good hull down position

- Take advantage of high and low ground. Wait at the bottom of a hill until the enemy tank is cresting the rise; this is a time when he is very vulnerable, since he cannot lower his gun to target you and you have a good chance of shooting the enemy in the tracks and immobilizing it.

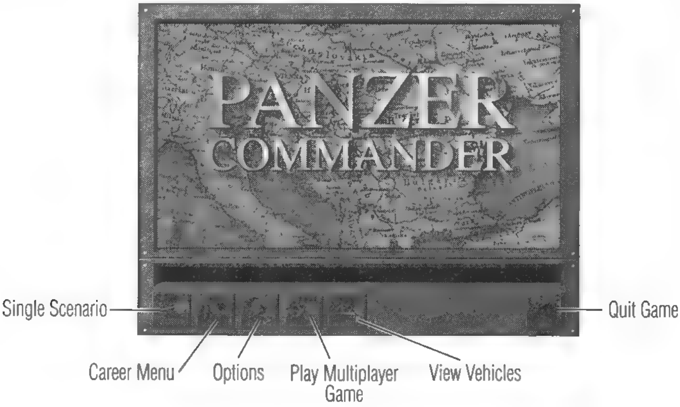
- Conversely, if the slope is steep, and you are coming over a hill, you have a shot at the vulnerable top armor of any tank waiting below you.
- Know the enemy. Can you sit and shoot at range because of his inferior guns or armor, or do you have to get up close and hope for a lucky shot to penetrate his thick shell? Is his hull armor weaker than his turret armor, or are both fairly strong, and is disabling the tank by shooting it in the tracks your best opportunity? Is your tank faster or slower than the enemy's? You are facing Panzer IVH tanks, and several other German vehicles in this scenario, the tank's statistics can be found on page 73 and German Ordnance descriptions begin on page 108.
- Know your tank. Go to the different viewing stations. Check the stats. Does your tank have a lot of armor that can deflect the enemy shells? If so you can risk going head on against enemy tanks. If your armor is low, but your speed high, it is probably wiser to avoid engaging enemy tanks directly, and instead maneuver around until you have optimal shots on your targets. Your tanks for this scenario vary by nation; check your tank type before you start the scenario.
- Know your crew. The levels of skill are, from least skilled to most skilled: Conscript (one star), Trainee, Regular, Veteran, Crack, and Elite (six stars). High ratings on their stats improve their performance. They track the enemy better, reload and follow orders more quickly. If your crew is inexperienced, you need to be more cautious, choosing shots carefully because it will take more time to load more ammunition, and maneuvering to closer distances because you can not rely on your gunner's accuracy. A wise commander can overcome a novice crew with good tactics.

After the Battle



If you have completed the scenario, either victorious – having destroyed all enemy tanks, by running out of time or through death, an Evaluation screen appears, showing the outcome and the time it took you to complete the scenario. The screen also displays a tally of the number of tanks, AFV's, trucks, anti-tank guns and buildings you and your platoon have destroyed. You are also shown the losses your side has taken. Click on the "checkmark" button to exit the Evaluation screen and return to the Main Menu.

MAIN MENU AND RELATED SCREENS



As you start the game, an introductory cinematic plays. Press the **Escape** button to exit the cinematic, and bring up the Main Menu. The Main Menu is the starting point for PANZER COMMANDER, and offers you the following choices:

Single Scenario

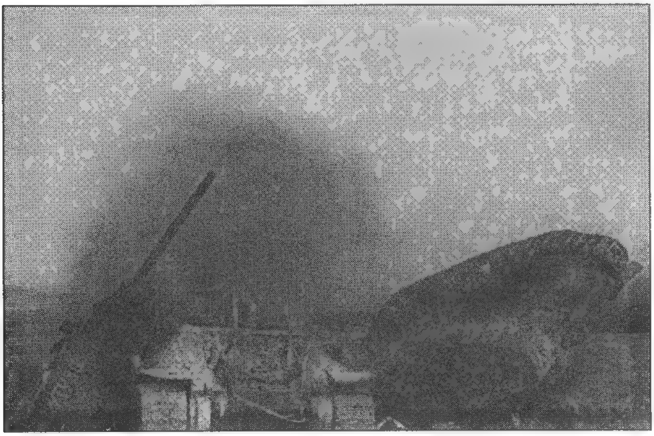
This brings up the Scenario Selection screen, where you can choose one of 40 stand alone scenarios. You can command a German, Soviet, American or British tank. For more information, see the *Playing a Single Scenario* section starting on page 19.

Career Menu

This brings up the Career Selection screen, from which you can choose to play through the career of either a Soviet or German tank unit. There are six different campaign games available. For more information, see the *Playing a Campaign* section starting on page 21.

Options

This brings up the Options Menu, from which you can alter various sound and display settings, set the level of realism, see the credits, or configure input devices. For more information, see the *Game Options* section starting on page 24.



Airstrike victims: Wrecked Soviet armor in the Ukraine, 1943

Multiplayer

This brings up a series of screens that allow you to host or join a multiplayer game over the internet or a local area network. Detailed information on setting up multiplayer games can be found in the *Playing a Multiplayer Game* section starting on page 32.

View Vehicles

This brings up the View Vehicles screen, from which you can view the 3D models of all the vehicles in PANZER COMMANDER and their vital statistics. Information on the View Vehicles screen can be found in *Viewing Vehicle Models* on page 39.

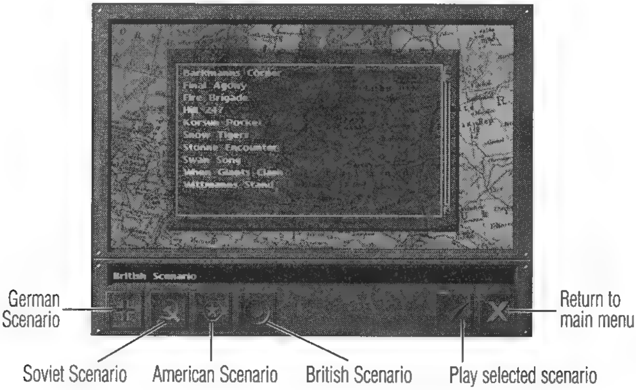
Quit Panzer Commander

The Quit button is located at the lower-right corner of the Main Menu screen. Clicking this button brings up the Quit screen. At the lower-left of the Quit screen is a button that, if pressed, exits PANZER COMMANDER. At the lower-right is a button that returns you to the Main Menu.

■ PLAYING A SINGLE SCENARIO

While you want to play one or all of the campaigns to get the most out of PANZER COMMANDER, we have also provided 40 stand alone for those moments when you need a "quick fix." These scenarios put you in the commander's cupola of German, Soviet, American or British tanks and many are based on historical tank battles.

Choosing a Scenario



To play a scenario, click on the Single Scenario button on the Main Menu display. The Scenario screen appears with buttons at the bottom displaying the symbols for the German, Soviet, American or British scenario categories and a list of scenarios at center screen.

The category buttons allow you to choose which army you wish to fight for. When you click on a country, a different list of scenarios appears in the list box. To choose a scenario, select one from the list and click on the "check mark" button in the lower-right corner of the screen. You may have to scroll down through the list box to see all of the scenarios. Windows-style scroll bars allow you to do this.

After clicking on the "check mark" a description of the scenario appears along with the type of tank you are commanding, and your crew rating. If you want to play the scenario, click on the "check mark" button again to enter the simulator, otherwise, click on the "X" button to return to the Scenario screen. If you decide you don't want to play a scenario, click on the Main Menu button on the lower-right corner of the Scenario screen to return to the Main Menu. See *Simulation Concepts* starting on page 40 for detailed information about controlling your tanks and playing the game.

Ending a Scenario

You can choose to end a scenario at any time during play by pressing the **Escape** key. The End Scenario screen appears, at the bottom of which are four buttons.

Continue Scenario in Progress

This returns you to the simulation, exactly where you exited it. This function allows you to use the **Escape** key as a Pause button.

Restart Scenario from Beginning

This restarts up the scenario. Note that choosing to restart a scenario erases any victory points you have accumulated in the scenario so far.

End Scenario and Save the Results

This ends the current scenario and brings up the Mission Evaluation screen. This function is particularly useful during campaign play, allowing you to end a scenario and go on to the next, once you have garnered enough points for a minor victory. However, if you end the scenario before achieving the minimum number of points for a minor victory, you lose the scenario, and must replay the scenario and win in order to progress in the campaign.

End Scenario

This exits the current scenario and returns you to the Main Menu, without saving your results.

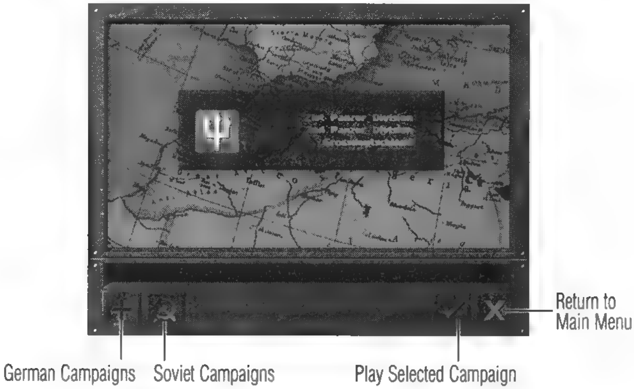
When you are done playing the scenario, an Evaluation screen is displayed which shows you how well you did. From there, a button allows you to return to the Main Menu.

Note that playing scenarios in this way does *not* affect your campaign record. If you wish to start a new campaign or return to a campaign in progress, use the campaign options described on the following pages.

PLAYING A CAMPAIGN

PANZER COMMANDER provides a number of options for campaign play which put you in command of a German or Soviet tank platoon. The campaigns are based in part on actual unit histories and take place in all of the major areas of operations in Europe, Russia and North Africa. A detailed history of the real life careers of these platoons is available as an electronic document, named HISTORY.PDF located on your game CD in the main directory. For help accessing this Adobe Acrobat File, see the *Electronic Documentation* section on page 3.

Loading a Career or Starting a New Campaign



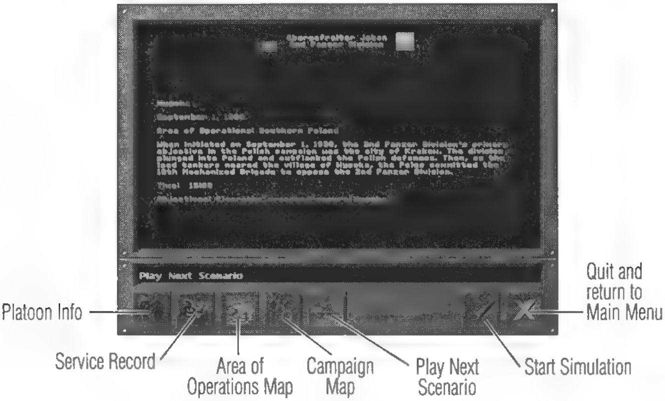
To begin a new campaign or return to an existing campaign, click on the Career Menu button located on the Main Menu. This brings up the Career screen. Select either German or Soviet armies using the two buttons at the lower-left corner. Choose the unit you wish to fight as from the options at center screen and click on the “check mark” button.

If you have previously started one or more careers as this division, they now appear in a list located at center screen. If you wish to resume one of these careers, choose one from the list and click on the “check mark” button.

If you want to start a new career, click on the button in the lower-left corner of the screen labeled New Career which displays the Recruitment screen. This contains a brief description of the unit and provides a text box into which you must type the name you wish to use as commander of the platoon. When you have typed in that name, click on the “check mark” button to begin your new campaign.

Once you begin a new career or load an existing career, briefing information for this area of operation is provided to set the stage for the next series of missions. You can proceed by clicking the “check mark” button. This brings up the Briefing Menu.

The Campaign Briefing Menu

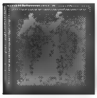


Several buttons can be found at the bottom of the Briefing Menu, which allow you to review your platoon's progress in the campaign, your career and your crew's experience; a description of the next mission scenario appears as a default. You can proceed with this mission and enter the simulator by clicking the "check mark" button. For details on playing a mission, see the section *Simulation Concepts* starting on page 40.

When you have finished the mission, an evaluation screen appears where your performance is evaluated and you are shown how well you did, including details about the number of kills, objectives achieved and whether this is a major victory, minor victory or a loss. This information is recorded and becomes part of your career statistics, which you can review using the Service Record option described below.

If you're unhappy with your performance in a particular mission, you have the option to immediately replay the scenario, even if you were killed in that mission. When you replay a mission, the new statistics replace those of your previous attempts and your service record is adjusted accordingly. Note that you can end the scenario you are playing at any time using the **Escape** key. See *Ending a Scenario* on page 20 for more information. Descriptions of the Briefing Menu buttons follow:

Platoon Info

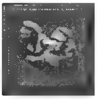


Click this button to display the current crew standings of every member of your platoon. This is in tabular form where each tank crew is listed down the table while each member of each crew is listed across. From left to right the crew members are Commander, Driver, Gunner and Loader. Although many tanks have stations for dedicated machine gunners, not all do and these are not tracked individually for your tanks.

Each crew member has an individual entry in the table which contains a number of stars which correspond to that crew member's experience level. At the beginning of your career, these crew members have only one or two stars, indicating that they are pretty green troops. It is up to you to make sure they survive long enough to gain experience. As they do, the number of stars for each increases.

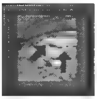
Occasionally some of your crew members are killed in battle. When this happens, you are given replacements who are most likely inexperienced and you are going to have to bring them up to speed. Naturally, it is in your best interests to keep your experienced crew members alive.

Service Record



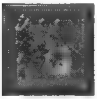
When you click this button your service record is displayed. This screen contains statistics regarding your battle performance, including major and minor victories, number of kills and number of tanks killed. It also displays any medals you have received for outstanding performance.

Campaign Map



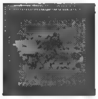
This button displays a large scale map of the European theater which highlights all of the areas of operation in which your unit has fought thus far in your career. As the war continues, the number of highlights grows as your unit is moved to different areas of operation. You can return to an area of operation by clicking on its highlight on the Campaign Map. This displays the Area of Operations map for that area.

Area of Operations Map



Clicking this button displays a more detailed map showing the general area in which your unit has fought. On this map are a series of highlights that show the location of every mission scenario you have played in this area.

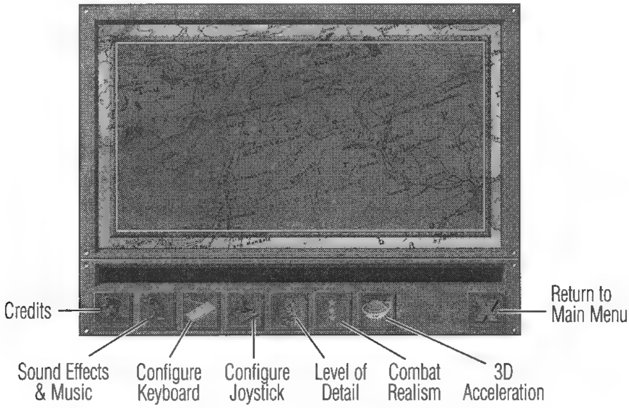
Play Next Scenario



If you have been playing earlier scenarios chosen from the Area of Operations, this button returns you to the latest mission scenario in your career. The briefing screen for that mission is displayed and you can launch that mission from there.

■ GAME OPTIONS

The Options Menu provides a number of settings which can be used to tune the behavior and performance of PANZER COMMANDER.



To access the Options Menu, select the Options button from the Main Menu. The row of buttons which appears at the bottom of the screen presents a number of categories of options which you can choose to adjust. We deal with each category separately in the following sections.

Credits

This option presents the names of all the hard-working folks who brought you PANZER COMMANDER. Click on the "X" button in the lower-right corner of the screen to return to the Main Menu.

Sound Effects and Music

This group of controls allows you to make general changes to the audio settings. Click on the "checkmark" button to save your changes and return to the Options Menu screen. Click on the "X" button to exit the Sound and Music screen without saving your changes.

Music Volume

This slider allows you to adjust the playback volume of music in the game. Moving the slider to the right increases the volume while moving it to the left decreases the volume.

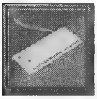
Sound Effects Volume

This slider allows you to adjust the playback volume of sound effects.

3D Sound Effects

This check box is used to enable or disable 3D sound effects. Note that many audio cards don't provide 3D sound processing, forcing your computer's CPU to do the work. This may result in slow performance on some machines. Disabling 3D sound may boost your performance somewhat.

Configure Keyboard Commands

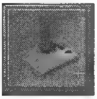


This settings screen allows you to change the way simulator commands are mapped to keys on your keyboard. While we have attempted to come up with a reasonable command set, you may find that you prefer to use different keys for some commands. To display the keyboard settings, click on the Configure Keyboard button at the bottom of the Options screen.

A list of commands with their associated keys is displayed at center screen. Note that the list is too large to be displayed fully, so you may have to use the scroll bar to the right of the command list to scroll some of the commands into view. To change a key command, select the command you would like to change using the mouse, then press the key on your keyboard which you would like to use to activate that command. That's all there is to it.

If the key you have chosen is already being used for a different command, then you need to either choose a different key or change the other command to use a different key. If there is such a conflict, the keys which conflict are shown in red until the conflict is resolved. If you exit this screen while a key conflict exists, the default command is used when that key is pressed.

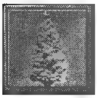
Configure Joystick



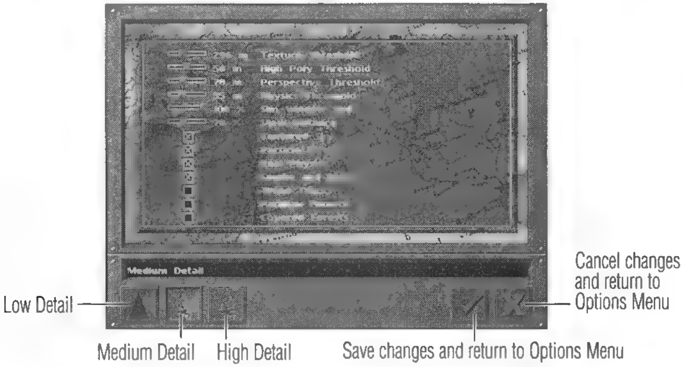
Clicking the Configure Joystick button on the Options screen displays the current list of joystick settings. These are changed in a similar fashion as the keyboard mappings. A list of commands is displayed along with their current joystick button assignment, if any. To assign a joystick button to the command, select the command with the mouse, then press the button on your joystick to which you would like to assign this command. Note that if the joystick button was previously assigned a different command, that command no longer has a corresponding joystick button.

Thrustmaster and *CH* joysticks are fully supported by Panzer Commander. For information about configuring other types of joysticks to work with this game, see *Using a Joystick in Panzer Commander* on page 5. Joystick input can disrupt keyboard play. If your joystick is not compatible with Panzer Commander, or you prefer using the keyboard alone, you can disable the joystick by unplugging it from your computer. Also, pressing the Spacebar for a joystick command sets it to disabled.

Level of Detail Settings



This group of controls allows changes to the general visual details and affects the performance of the simulator in both Software Rendering mode and in 3D Accelerator mode. Although Panzer Commander has been tuned to get the best possible performance, you may experience reduced frame rates on slower machines. If you are experiencing slow performance in the simulator, you can make adjustments here which improve the situation — at the expense of some visual realism.



Use the Detail Settings button at the bottom of the Options Menu to bring up the Detail Settings screen. From here you can adjust the level of detail by selecting one of the three buttons at the bottom of the screen. Low turns most of the detail settings off for the most rapid graphics display, Medium turns some on, but leaves others off to form a balance of speed and appearance, while High turns all of the detail settings on, for the most appealing graphics, but possibly reducing the speed of the game. You can also turn each setting on or off individually, to tailor the game to your visual preferences.

Texture Threshold

This slider bar allows you to control the apparent distance at which simulator graphics employ texture mapping. The farther to the right the slider bar is positioned, the greater the distance at which texture mapping is employed. You can improve the performance of the simulator by sliding the bar to the left using your mouse. This reduces the amount of terrain and the number of objects that are texture-mapped, increasing the frame rate and smoothing simulator performance. This is most effective in the software rendering engine, but also improves performance on slower 3D accelerators.

High Polygon Threshold

Panzer Commander uses object models of varying detail levels to improve rendering performance. Objects that are closer tend to employ the more detailed, "high polygon" models, while objects that are farther away are rendered with less detail. This setting allows you to control the distance at which low-detail models are substituted. You can improve performance by moving the slider bar to the left. This reduces the distance at which low-detail models are substituted, resulting in fewer high-detail models being used and improving performance. This can have a big impact on both software and 3D-accelerated rendering engines.

Perspective Threshold

Perspective correction is a technique which enhances the quality of texture mapped images. When not employed, the texture mapped images tend to warp disconcertingly. Unfortunately, perspective correction is an expensive process for the software renderer to perform and may cause slow performance on some computers. This slider adjusts the distance up to which perspective correction is employed. By sliding this bar to the left, less terrain and fewer objects employ this technique and performance improves. This setting only works with the software renderer.

Physics Threshold

Panzer Commander employs some of the most advanced ground vehicle physics available in a computer game. Unfortunately, the calculations required to portray this level of realism can be expensive. To improve performance, the simulator substitutes a less accurate physics model for objects at a greater distance. This slider allows you to adjust the distance at which the low-accuracy model is substituted. By sliding this bar to the left, the low-accuracy model is used sooner and performance improves, whether you are using the software renderer or a 3D accelerator.

Simulation Window Size

In general, the more pixels that have to be rendered, the poorer your simulator performance. This slider allows you to regulate the size of the window being rendered for external views. By sliding the bar to the left, you can reduce the window size and improve simulator performance. This is more effective for the software renderer since 3D accelerators tend to be more efficient at filling in pixels.

Maximum View Distance

The rendering engine employed in Panzer Commander only draws objects out to a certain distance from the view point, allowing it to avoid drawing objects which are really far away, thus improving performance. This slider allows you to adjust the distance beyond which no rendering occurs. We suggest using this setting only in extreme circumstances as reducing the view distance may make it difficult to achieve the tactical goals of some missions.

Sky Texture

This check box allows you to turn the sky texture on or off. Generally, turning it off improves performance, especially in the software renderer

Particle Effects

This feature improves the display of explosions. You may see a slight performance improvement if it is disabled.

Real Physics

This check box allows you to disable the advanced physics, forcing the simulator to always use the low-accuracy physics calculations. You may find that it is sufficient to use the Physics Threshold setting described above, rather than disabling accurate physics completely.

Smoke and Dust

You can use this check box to disable smoke and dust effects, which can improve performance slightly in some situations.

Tread Tracks

Turning this check box off disables the tracks left by tank treads in the simulator for a slight performance improvement.

High Detail Forest

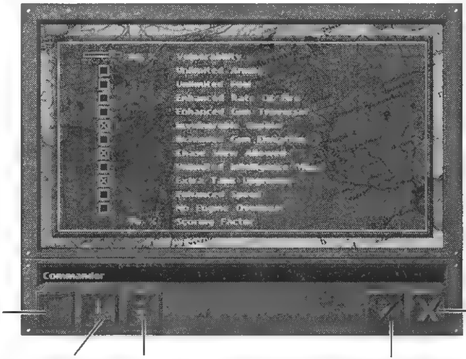
Turn this check box off to reduce the detail level at which forests are rendered for a significant performance improvement in scenarios where forests are employed.

Covered Forests

Turn this check box off disables the appearance of trees in the center of a forest; leaving a "box" of trees, and speeding up performance in scenarios where forests are employed.

Adjusting Simulation Realism Settings

PANZER COMMANDER allows you to adjust several realism factors that can make the game easier or more difficult to play. By default, these are set to allow a moderate level of play. Please note that if you turn all of these realism settings off the game can be very difficult to play. Real World War II tank warfare was no picnic and in many cases survival rates for tankers was very low. You have been warned.


Commander
Low Realism
Medium Realism
High Realism
Save changes and return options menu
Cancel changes and return to options menu

The Combat Realism screen presents a number of check boxes which allow you to change the settings which affect simulation realism. Use the Combat Realism button at the bottom of the Options Menu to bring up the Combat Realism screen. From here you can adjust the level of difficulty of play by selecting one of the three buttons at the bottom of the screen. Recruit turns most of the realism settings on for easy play, Commander turns some off, but leaves others on to create a moderate challenge, while Ace turns all of the realism settings off, for a tremendous challenge. You can also turn each setting on or off individually, to tailor your playing preferences.

Vulnerability

This setting can render your tanks invulnerable to enemy fire, allowing you to wade into any situation and wreak maximum carnage. 0% is invulnerable, 100% is realistic. By default this is at 100%.

Unlimited Ammo

This setting provides all guns on your tank with unlimited ammunition. By default, this setting is off. You may wish to turn it on during the early learning stages since you tend to use more ammunition.

Unlimited Fuel

Turning this on allows you to drive your tank without the fear of running out of fuel. Most of the time you have sufficient fuel to complete your mission, but this may not always be the case. If you're running out of fuel you can turn this on to remedy the situation. By default this setting is off.

Enhanced Rate of Fire

Turning this on maximizes the stats for your loader, making him as efficient as possible. You may want to turn this on for your early missions as it gives you a better rate of fire. By default this is off.

Enhanced Gun Traversal

This setting allows you speed up the movement of the main gun. When this setting is off, the gun has a slower, more realistic traversal time. By default this is off.

Extended Gun Elevation

This setting grants your Main Gun a greater range of vertical movement. By default this is off.

Invulnerable Cupola

When you are using the unbuttoned cupola view, the binocular view and the external view, it is assumed that your commander's head is poking out of the cupola hatch. This is a vulnerable position to be in if you are under fire and can result in the injury or death of your character. This option allows you to disable the vulnerability of your character when using one of these views. By default this is on; disable it at your peril!

Chase View Allowed

Real World War II tanks didn't come equipped with an external camera view. By default, PANZER COMMANDER allows you to use this view **(F1)** to survey your tank and the surrounding terrain. Turning this setting off disables that ability.

Intelligence Map On

Inside the Commander's cupola there is a map display that shows you the surrounding terrain, including roads and rivers, the positions of all of your tanks and the way points assigned to you for this mission. Enabling this setting causes enemy unit positions to be displayed on the map as well. By default, this setting is disabled.

Extra Tank Upgrades

In career mode, you are occasionally offered the chance to upgrade to a more advanced tank for a particular scenario if you are doing well. If you turn this option off, you are never offered the upgrade and you receive new tanks only at the prescheduled times. By default, this setting is enabled.

Enhanced Speed

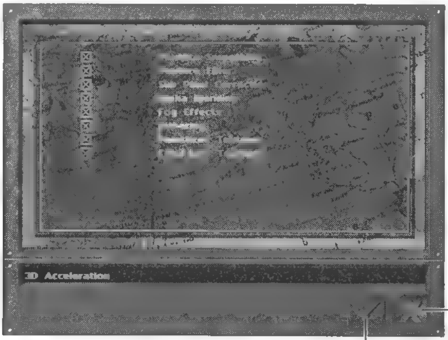
This setting can be used to improve the top speed of some tanks. This is particularly useful for the British infantry tanks like the Matilda, Valentine and Churchill, which have a very low top speed. By default this setting is disabled.

No Engined Overheat

Prevents your engine from overheating even under great stress. By default this is off.

3D Accelerator Settings

These settings are particular to 3D accelerators and do not affect the software renderer. Note that some accelerators do not support the features described here, so altering these settings may not affect the behavior of your accelerator. We recommend checking your 3D accelerator documentation if you have any questions about whether or not your card supports a particular feature.



Cancel changes and return to options menu

Save changes and return to options menu

Texture Smoothing

This setting enables continuous smooth shading for texture-mapped objects. Note that this only affects those objects which are intended to be smooth – most particularly it affects the way the terrain is rendered. We've found that disabling this doesn't affect the performance of most accelerators that much, but your mileage may vary.

Texture Filtering

This feature is used to improve the rendering of texture-mapped objects. When filtering is on, texture maps look less "chunky" but appear a bit blurry to some people. Some accelerator cards exact a significant performance penalty for filtering, so you may get a decent performance boost by turning this off.

Sub Pixel Filtering

This technique is used to improve the accuracy of the texture mapping process and can, like filtering, cause some loss of performance. This check box allows you to disable Subpixel Correction.

Alpha Blending

This feature allows some types of transparency and translucency effects. These are used in Panzer Commander for shadows, dust and the like. Disabling this may give you a slight performance improvement on some 3D accelerators.

Fog Effects

Atmospheric effects are one of the most interesting capabilities of current 3D accelerators and can significantly enhance the visual experience. Unfortunately, it can also slow performance on some video cards. Disabling this feature may improve performance on your accelerator.

Dithering

Most 3D accelerators operate most efficiently with a 16-bit display. Unfortunately, this isn't sufficient color resolution to prevent banding and other artifacts for certain types of imagery. Dithering improves the quality of such imagery at some cost in performance. Turning dithering off may improve the performance of your 3D accelerator.

Palettized Textures

The rendering engine in Panzer Commander attempts to conserve video RAM by storing texture maps in an 8-bit format, if the video card supports this. This can improve performance by reducing the number of textures that need to be moved onto the card for each video frame. Unfortunately, this format can itself cause performance problems on some video cards. Turning this off disables the use of 8-bit textures and may improve performance on some older 3D accelerators.

Color Key Textures

This is less of a performance setting than a visual accuracy setting. Some accelerators support the ability to render texture maps using a color key to mask off certain areas of the texture. Panzer Commander uses this feature to render puffs of smoke and other imagery with irregular edges. Unfortunately, some drivers erroneously report this ability when in fact it is not supported. If you see imagery in the simulator with black, squared-off edges (smoke for example) then disabling this setting may correct the problem.

Weakness in numbers: Pre-War Soviet armor on parade in 1940.

■ PLAYING A MULTIPLAYER GAME

Panzer Commander allows multiple player missions to be played over a local area network using the IPX or TCP/IP protocols or over the Internet using TCP/IP. Some of the missions feature head-to-head play while others involve cooperative play to achieve common mission goals.

Panzer Commander uses Microsoft's DirectPlay technology for its network support. You want to make sure that your network adapters and drivers are compatible with DirectPlay. Most are, so this won't normally be a problem.

Network Protocol Selection

Network Protocols are the "languages" that computers use to communicate with each other. Panzer Commander supports the IPX and TCP/IP network protocols. IPX is a protocol commonly used for local area networks, while TCP/IP is the protocol used by computers linked to the Internet. While you can play Panzer Commander over the Internet, we can't guarantee good performance, due to network speed and latency issues. See *Network Troubleshooting* on page 37 for more information.

You first want to make sure that the network settings on all of your computers are configured to use the IPX or TCP/IP protocols. If you already have a working Internet connection and you want to play Panzer Commander over the Internet, you can probably skip the next section which simply tells you how to verify the presence of a compatible network protocol on your computer.

Verifying the Presence of IPX or TCP/IP

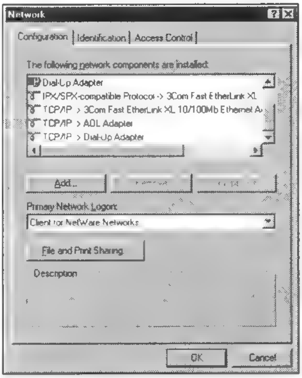
To find out if your computer's network is configured correctly for Panzer Commander, open your Network Control Panel from your Windows 95 Control Panels folder. If you're not sure how to do this, we recommend reading your Windows 95 manual or using the Windows 95 Help feature for information regarding network configuration and the Network Control Panel. You want to have a good understanding of network issues before attempting to set up a multiplayer game.

In the Configuration tab of the Network Control Panel there is a box with a list of network components. Scroll down the list looking for IPX or TCP/IP protocol components. For IPX, you should see something like one or both of the following:

IPX/SPX-compatible protocol -> [your brand] Ethernet Adapter
IPX/SPX-compatible protocol -> Dial-Up Adapter

For TCP/IP protocol, you should see something like one or both of the following:

TCP/IP protocol -> [your brand] Ethernet Adapter
TCP/IP protocol -> Dial-Up Adapter



The following network components are installed:

Dial-Up Adapter
IPX/SPX-compatible Protocol -> 3Com Fast EtherLink XL
TCP/IP -> 3Com Fast EtherLink XL 10/100Mb Ethernet A
TCP/IP -> AOL Adapter
TCP/IP -> Dial-Up Adapter

Primary Network Logon:
Client for NetWare Networks

If you connect to your network through a modem using the Dial-Up Adapter, you can still play PANZER COMMANDER multiplayer games as if you were connected locally. However, there may be some performance degradation due to the slower nature of modems.

If you don't see any of these components in the component list, you need to add at least one of them to your network configuration before you can host or join a multiplayer game. Consult your Windows 95 documentation for the proper procedures.

Which Protocol Should You Use?

Obviously, if only one of the compatible protocols is present, that is the one you have to use. If you're playing over the Internet, TCP/IP is your only choice. If you're playing over a local network, however, IPX makes it a little easier to set up your game, so you may want to use that if you have a choice. On the other hand, PANZER COMMANDER works fine over a local network using TCP/IP. Ultimately, if you have a choice you should choose the one that works best for you, though determining this may require some experimentation.

Setting up a Multiplayer Game

In every multiplayer game one computer is designated to be the "host." This is simply the computer that starts the game and serves as the central "switchboard" for network messages, also known as "packets."

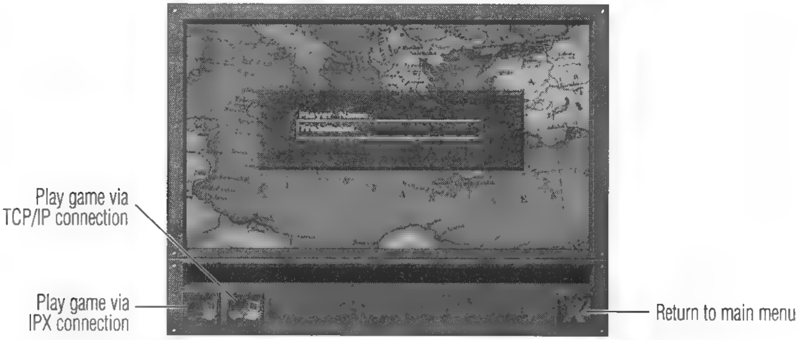
It is important to choose the right computer to be the host. The best candidates are those computers with the best network connections or the best performance. For example, if you're playing over the Internet and one computer has an ISDN connection while the others connect through modems, the one with the ISDN connection would be the best choice to be the host since it probably has faster access to the Internet. On the other hand, if all computers are connected to a local area network, you should probably choose the fastest computer to be the host.

If you're connecting through the Internet or other TCP/IP network, Windows 95 comes with a command-line program called Ping which allows you to test network performance between any two computers. See the section on *Network Troubleshooting* on page 36 for information about how to use this.

Beginning Your Multiplayer Session

You have two options for taking part in a multiplayer game: you can create a new multiplayer game with your computer as the host, or you can join in an existing game being hosted on someone else's computer. PANZER COMMANDER also provides you with a "chat room" feature, which allows you to communicate with other players by typing messages to them. See the section *Using the Chat Feature* on page 36 for more information.

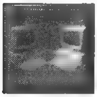
To begin, choose the Multiplayer option from the Main Menu. This brings up the Multiplayer Configuration screen, which takes you through a series of dialogs designed to help you get your multiplayer game going.



The first thing you are asked to do is provide your player name. This is the name associated with you in the context of the game. Type something in the text box at center screen which uniquely identifies you among the other players. If all else fails, your real name should work just fine. PANZER COMMANDER remembers this name so that you won't have to type it in the next time you host or join a multiplayer session.

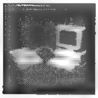
Next you must choose a network protocol for your game. Two buttons appear at the lower-left of the screen. One is labeled IPX while the other is labeled TCP/IP. Click one to choose the protocol you want to use.

IPX



If you choose IPX protocol, you aren't asked to enter an address of any kind. IPX is primarily a local network protocol and PANZER COMMANDER knows how to find other games on the local network.

TCP/IP

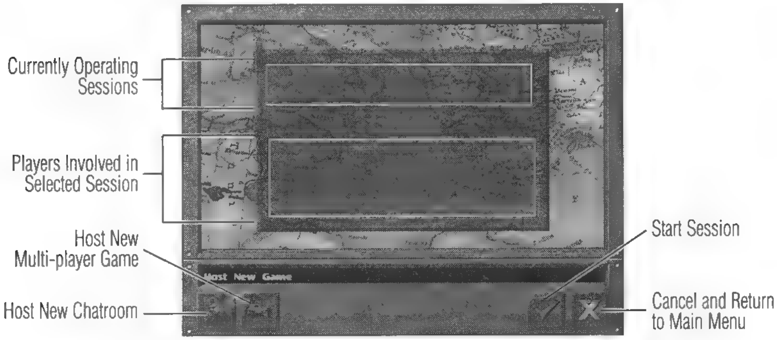


If you choose TCP/IP you are asked to enter an "IP" address. The address is a four-part number which uniquely identifies a remote computer on the Internet. This allows you to specify the address of a remote computer which serves as the host for a game you want to join. If you enter an address then click on the "check mark" button, PANZER COMMANDER looks for a game or a chat session hosted on that computer and, if it finds one, it is listed in the Session screen.

You can also choose to leave the address blank. When you click on the "check mark" button, Panzer Commander looks for a list of games and chat sessions on the local "subnet", which is the part of the Internet "closest" to your computer – usually all of the computers connected to your Internet provider. This works well if all of the people you wish to play with are connected to the same Internet provider. This also yields the best performance for your game since messages are routed over the shortest possible distance. You also want to leave the address blank if you want to host the game on your computer. More about hosting a little later.

Joining an Existing Game or Chat Session

The next screen you see is the Session screen, which contains a two-part list. The top part shows the Panzer Commander games and chat sessions currently operating on the network, if any. When you select a game or a chat session using the mouse, the bottom part of the list shows all of the players currently involved with that game or chat session.


Currently Operating Sessions
Players Involved in Selected Session
Host New Multi-player Game
Host New Chatroom
Host New Game
Start Session
Cancel and Return to Main Menu

If you wish to join a game or chat session in progress, choose one from this list by clicking on it with your mouse. Once selected, click on the "check mark" button at the bottom of the screen to join. If this is a chat session, the chat screen comes up. If this is a multiplayer game session this launches the simulator and you join the battle in progress.

Hosting a New Game or Chat Session

If you decide to host a new game or chat session on your computer, click either the Host New Chat Session or the Host New Game button at the lower-left corner of the Session screen. A text box appears which requires you to enter a name for the game or chat session you are hosting. This is the name which appears in the Session screen for the other players when they look for a game or chat session to join. Try to pick a name for your session which isn't currently being used – this makes it easier for other players to find your game or chat session. Click on the "check mark" button when you are finished entering your session name.

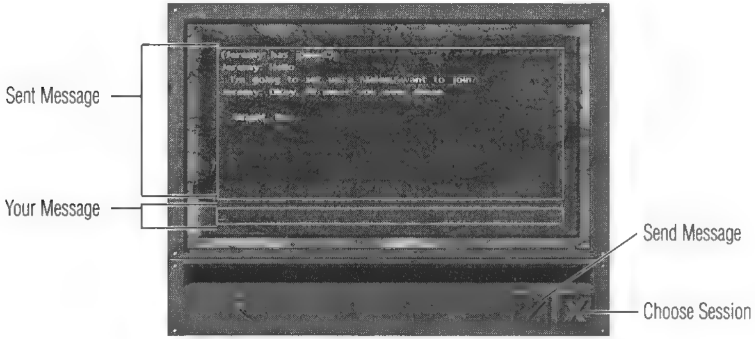
If you have chosen to host a chat session, the Chat Room screen appears and you can begin trading chat messages with other players. See the section below on *Using the Chat Feature* for more information.

If you are hosting a new game, a list of multiplayer mission scenarios appears. It is the host's privilege to determine the mission scenario in which the players do battle. Select one from the list using the mouse and click on the "check mark" button.

When the other players join your game, all of the mission data is transmitted to their computers via the network, which can cause some delays, especially on modem-equipped systems. However, this allows you to create your own multiplayer scenarios using the Scenario Editor without worrying about how the data is transmitted to the other players.

Using the Chat Feature

The Chat Room feature is provided to allow you and the other players to "rendezvous" in cyberspace without the need for phone calls or other "low tech" forms of communication.



The Chat Room is pretty simple to operate. A list box appears at the top which contains the chat messages typed in by all players since you joined. Below this is a text box into which you type any chat messages you want to send. Pressing the Enter key or clicking on the "check mark" button broadcasts this message to everyone who has joined the chat session. When your chat session is finished, click on the Choose Session button at the bottom to return to the Session screen.

In-Game Chat

To chat during gameplay, you must be in the **F4** screen. Messages from other players appear at the bottom of the screen above the Status Bar. To send a message, press **Enter**, type your message, and press **Enter** again. Your message is sent to all players.

Network Troubleshooting

Multiplayer games can be tricky to set up due to the vagaries of local area networks and the Internet. This section provides some information to help you solve any problems you may encounter in setting up a multiplayer game in PANZER COMMANDER.

Connection Problems

If you're not seeing game sessions in PANZER COMMANDER, there is most likely some kind of network configuration problem. Review your network configuration as described in the section titled *Verifying the Presence of IPX or TCP/IP* on page 32 to make sure that one of these protocols is installed correctly on your computer. Make sure that the game you are trying to join is using the same protocol you are. If you are hosting a game yourself, make sure everyone who may want to join knows which protocol to use.

There may also be a problem with your physical connection. If you are using a local area network, one way to verify your connection is to activate Windows 95 File Sharing on one computer and see if it is visible in the Network Neighborhood window on the others. Consult your Windows 95 documentation if you aren't sure how to do this.

If you are playing over the Internet, the best way to verify your connection is to start your web browser and make sure that it is working properly. If you are on a dial-up connection to the Internet, we recommend activating your connection *before* launching PANZER COMMANDER. This avoids any unpleasant trips to the dialer window in the middle of the game.

If you're trying to play with someone who is on a different subnet – most likely because he uses a different Internet provider than you – chances are one of you has to provide his IP address to the other in order to make the connection. You can obtain this information using a program called WINIPCFG.EXE which is located in your Windows directory. However, you have to establish your connection *before* running this or you may not get the correct address.

We don't recommend playing PANZER COMMANDER over the Internet except with other players whose computers are connected to the same Internet provider or to the same local network as yours for reasons which we outline in the next section.

Performance Problems

The smoothness of game play over a network is highly dependent on the performance of the network hardware and the amount of traffic it must carry. If at all possible, you should play multiplayer games on a small network that is isolated from outside influences.

PANZER COMMANDER is a real time simulation game which generates a modest, but continuous amount of network traffic. Busy networks slow the flow of game data between different computers, resulting in poor responsiveness. If you are playing on a busy local network, your only choice is to isolate those computers on which you want to play. For a variety of reasons this may not be possible. Play only when network traffic is low. In a company environment you may want to play at lunchtime or after everyone else has gone home.

If you are playing over the Internet, performance can be even more problematic. Your game data may have to travel through a number of different routers and computers before it gets to the other player's computer. Each step in this chain increases the amount of time it takes for the data to reach that computer. Over great distances, it may take *seconds* for data to travel from one computer to another. This time delay is called *latency*. Even if both computers have fast connections to the Internet, latency can still be high because of the number and performance of intervening routers.

The reason that large latency times are bad is that, in a real-time simulation, it is necessary to continuously update the positions of all of the objects in the game universe. This position data must reach all players at nearly the same time in order for everyone to perceive the same conditions at the same time. For example, you might be driving your tank into a gully to avoid fire from one of the other players. If there is high latency, the other player may still have your tank in his sights *after* your tank has reached safety (from your perspective.) If he fires under these conditions, your tank can be damaged, though you may perceive that it was impossible for him to achieve such a hit.

While PANZER COMMANDER does its best to handle latency problems, the best solution is to avoid playing multiplayer games under high-latency conditions. Your best bet for doing this is to play only with other players whose computers are connected to the same Internet provider or the same local network. This minimizes the number of routing steps between your computers, thus minimizing the network latency.

If you have some question about the latency between two computers you can use the **PING.EXE** program supplied with Windows 95. Both computers need to be connected to the Internet and you need the IP address of one of the computers to make the test. Use **WINIPCFG.EXE**, located in your Windows directory to obtain this information.

When you have the IP address of one of the computers, open up an MS-DOS prompt on the other computer, then type PING and the IP Address, and press the Enter key. For example, if the IP address of the machine you want to test is 202.55.100.20, type:

```
PING 202.55.100.20
```

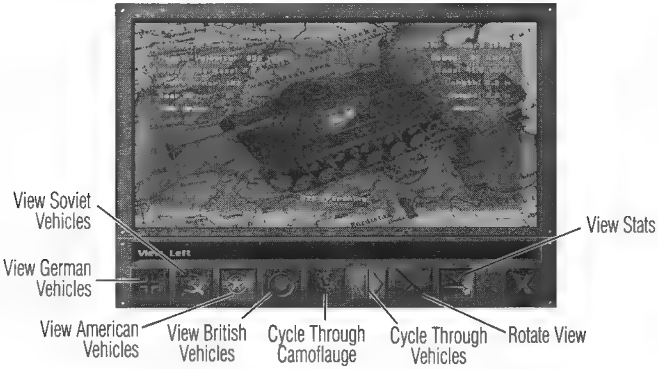
and press the Enter key. You should see something like this:

```
Pinging 202.55.100.20 with 32 bytes of data:

Reply from 202.55.100.20: bytes=32 time<10ms TTL=32
Reply from 202.55.100.20: bytes=32 time=1ms TTL=32
Reply from 202.55.100.20: bytes=32 time<10ms TTL=32
Reply from 202.55.100.20: bytes=32 time<10ms TTL=32
```

The important thing to note here is the "time" value returned by PING. The above times are very good because this was run on a very small Ethernet network with very little traffic. What you see here are all times less than 10 *milliseconds*, or less than one one hundredth of a second. Times less than 100 milliseconds (one tenth of a second) are usually good while times less than 200 milliseconds (one fifth of a second) are probably acceptable. Anything over 200-300 milliseconds is probably too much latency for good performance and should be avoided, if possible.

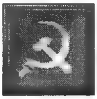
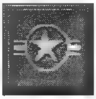
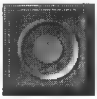
■ VIEWING VEHICLE MODELS



PANZER COMMANDER allows you to review the vehicles of all the major powers portrayed in the game. You may want to do this from time to time to brush up on the capabilities of your own vehicles and those of your enemies. Knowing the relative strengths and weaknesses of the vehicles you are fighting is one of the keys to victory in PANZER COMMANDER.

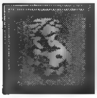
Clicking on the View Vehicles button from the Main Menu brings up the View Vehicles screen. At the bottom of the screen is a row of buttons that allow you to control the vehicle display. The vehicles themselves appear at center screen.

Choose Vehicle Nationality

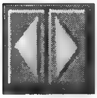
The four buttons on the lower-left allow you to choose the army whose vehicles you wish to review. You may choose from German, Soviet, American and British forces.

View Vehicle Colors



To the right of that is a Change Color button which allows you to toggle through choices for the coloring of the vehicle. Each vehicle in PANZER COMMANDER can have one of three color schemes: base color, camouflage, or whitewash. The base color is the standard all-over color for that army, usually tan for the Germans and green for everyone else. Camouflage was applied most often by the Germans but was used by the other forces as well. Whitewash was often applied in the winter to make the tank less visible in the snow.

View Next or Previous Vehicle



Next is a pair of arrow buttons which allow you to change which vehicle is displayed. When you click on the right-arrow button, you get the next vehicle in the order in which it appeared in the war. Thus, as you advance through the list you will see vehicles and variants which appeared later in the war. Clicking the left-arrow button has the opposite effect and shows you earlier vehicles.

Vehicle Rotation

The triangular buttons arranged in a square allow you to change the angle from which the vehicle is displayed. The left and right triangle buttons rotate the view horizontally around the tank while the top and bottom triangle buttons increase and decrease the view elevation respectively. Once you change the angle of view of a vehicle, all other vehicles are displayed from that angle as well.

Vehicle Statistics

This button toggles the information display. When on, the image of the tank is reduced and valuable statistics for that vehicle are displayed to either side of it. It is most important to note the vehicle's armor ratings, the muzzle velocity of its main gun and its maximum speed. See the section on tank tactics for a good overview of how to make use of this information. Clicking the button again restores the vehicle to its larger size and removes the information.

When you are done looking at vehicles, the Main Menu button at the lower-right corner of the screen returns you to the Main Menu screen.

■ SIMULATION CONCEPTS

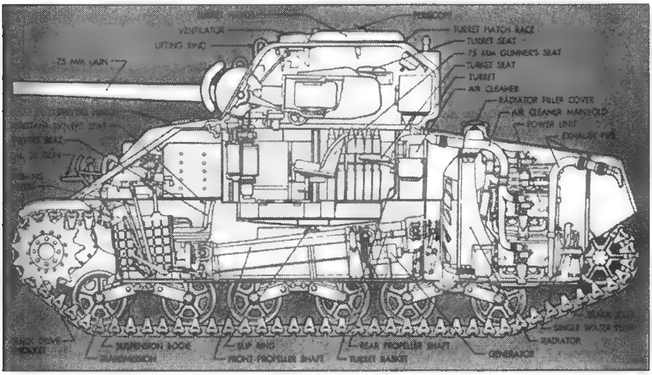
World War II saw the rapid development of tanks and tank combat tactics. PANZER COMMANDER attempts to accurately reproduce the capabilities of the many varieties of tanks available during this conflict. This section details the operation of the tank and its equipment and the interactions between the tank commander and his crew. It also discusses platoon operations and tank tactics.

Crew Positions

Successful operation of a World War II tank requires smooth cooperation among the tank's crew and this is the responsibility of the tank's commander. PANZER COMMANDER simulates the interaction among the tank crew and the development of the crew members' abilities during a campaign. If you're playing in campaign mode, you want to make sure that your crew stays intact because their performance in the simulation is directly affected by their ability levels. Likewise, as platoon leader you want to keep the crew members of your other tanks alive.

In PANZER COMMANDER, each tank has a commander, a driver, a loader, a gunner and depending on model, a bow machine gunner, each with specific responsibilities as detailed below. Each crew function except for the loader is associated with a position screen on which is displayed useful information pertaining to that function. You can choose to operate all of the tank's systems yourself, but you may find that it's better to take advantage of the abilities of your crew members.

Historical Note: *Some tanks of World War II didn't actually have the full complement of crew members outlined above. In some cases the commander also served as gunner or loader and, occasionally, no bow machine gun was present. For the sake of simplicity, Panzer Commander assumes that all tanks have at least a commander, gunner, driver and loader.*



Schematic of an M4A3 Sherman.

Commander

The tank commander is responsible for controlling the tank's operations and coordinating the efforts of the crew. In addition, the commander is responsible for achieving the objectives assigned by his superiors. The commander's cupola screen contains functions specific to the commander's tasks and can be brought up with the **F4** key.

Driver

The driver is responsible for driving the tank as directed by the commander. A skilled driver better anticipates terrain difficulties and more efficiently guides the tank between way points. The driver's position screen is brought up with the **F5** key.

Gunner

The gunner's responsibility is aiming the main gun and delivering the tank's ordnance to the target. A skilled gunner hits the target more accurately and more quickly lays the gun on the target. In addition, most tanks have a machine gun coaxial with the main gun for which the gunner is also responsible. The gunner's position screen can be displayed using the **F6** or **F7** key.

Loader

The loader is responsible for reloading the main gun between firings. He is also responsible for choosing the correct ammunition type as ordered by the commander. An effective loader is able to reload the main gun more quickly.

Machine Gunner

The machine gunner operates the bow machine gun against infantry and other designated targets. An effective machine gunner more consistently and efficiently hits the targets assigned to it. The bow machine gunner's position can be displayed using the **F8** key.

Changing the View

In PANZER COMMANDER you are allowed to change the camera view to a number of different positions relative to your tank and the other tanks in your platoon. The following is a summary of the different view positions and the keystrokes which activate them:

F1 – External tank view. In this view the camera always points towards your tank. This view is not available at higher realism settings. You can reposition the camera using the following keystrokes:

Keypad 7 – Reduce the camera elevation.
Keypad 9 – Increase the camera elevation.
Keypad 1 – Rotate camera clockwise around the tank.
Keypad 3 – Rotate camera counterclockwise around the tank.

F2 – Commander's cupola view, unbuttoned. This is the view you would have from the commander's cupola with the hatch open and your head sticking out. This makes your character more vulnerable to injury should you come under fire, so you should be careful how you use it. You can rotate this view to scan the horizon using the following keystrokes:

Keypad 1 – Pan to the left.
Keypad 3 – Pan to the right.
Keypad 7 – Pan up.
Keypad 9 – Pan down.

F3 – Commander's cupola view, with binoculars. This is another view you would have from the unbuttoned commander's cupola, except this time you are viewing through a pair of binoculars which can allow you to see objects farther away. Like the other unbuttoned view, this can be panned using the same keystrokes.

F4 – Commander's cupola view, buttoned up. This is the view from the commander's cupola, similar to the unbuttoned view, but you are looking through a smaller vision slit or periscope. Although your view is more constricted here, your tank commander is safer. Plus from the buttoned up view, you are able to see the commander's map which gives general terrain features, and your way points for the mission. During Multiplayer games, this is where chat occurs.

F5 – Driver's view. This is the view you would have from the driver's seat. It includes a set of gauges which is discussed in the section, *Driving and Basic Navigation*, starting on page 43.

F6 – Gunner's view. This view provides access to the basic gunnery functions for the main gun and the coaxial machine gun, if present. It provides you with an aiming reticle and 2.5x magnification for sighting targets and laying the gun. There is more information about this in the sections *Operating the Main Gun* on page 45, and *Operating the Coaxial Machine Gun* on page 52.

F7 – Gun sight view. This is a 5x magnified gun sight which allows you to better target more distant objects. The Range Finder is available in this view. See *Using the Range Finder* starting on page 47 for more information.

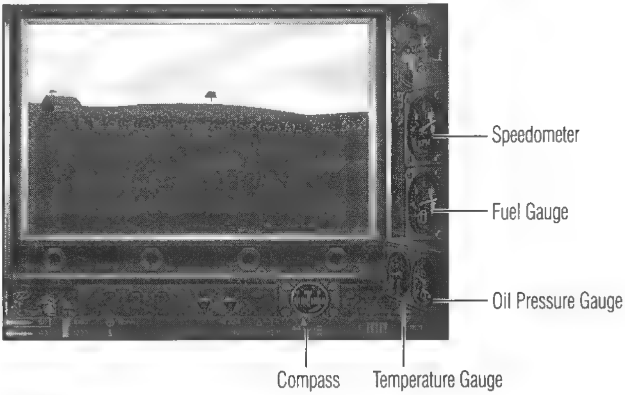
F8 – Bow machine gun view. This view allows you to operate the bow machine gun.

V – This moves the view to the next tank in your platoon. This allows you to see the action from the vantage point of any of your platoon members.

Driving and Basic Navigation

The tank can be driven from any position using the **arrow** keys. The left and right arrow keys steer the tank and the up and down arrow keys increase and decrease the throttle respectively. The down arrow also puts the tank into reverse. A bar graph indicator in the center of the status bar at the bottom of the screen shows the current throttle position. Use the **Delete** key to engage the brakes. This also reduces the throttle setting and places the transmission in neutral. To bring the tank to a complete stop, you may have to press the Delete key down several times.

You can also use a joystick to drive the tank. Pull the stick left and right to steer the tank. Push forward on the stick to increase the throttle and pull back on the stick to reverse the throttle.



The **F5** View,
Driver's View

Pressing the **F5** key brings up the driver information display which incorporates a number of useful gauges grouped around the driver's vision slit, and provides you with a view from the "driver's seat" of your tank. The gauges are:

Speedometer: This tells you how fast the tank is currently moving.

Fuel Gauge: This tells you how much fuel you have left. If you run out the scenario ends. In general, the faster you are driving the less efficiently the tank is using fuel. Depending on how far you must travel and how much fuel you have you may have to drive more slowly to complete an operation.

Temperature Gauge: This tells you how hot the engine is running. Most World War II tanks were not designed to be run flat out for long periods of time. If you do so, your engine may overheat – especially in desert scenarios. If this happens your engine shuts down and the scenario ends.

Oil Pressure Gauge: This tells you the engine's current oil pressure. This can be used to gauge the general condition of your engine. When an engine is running too hot or if it has suffered damage, the oil pressure is lowered. If you run the engine too long under low oil pressure conditions, it can fail and end the scenario.

Even the terrain was an enemy: German assault guns in the mud, 1943

Navigation and Way Points

Most of the single player and campaign missions in PANZER COMMANDER include a set of way points for your units to follow. Generally these are designed to take you to your mission objectives. However, you're perfectly free to deviate from this suggested course and many times you have to in order to gain some tactical advantage.

The status bar shown at the bottom of the screen shows you which way to turn to reach the next way point. An arrow symbol to the left of the compass heading is telling you to turn left, while an arrow symbol to the right of the compass heading is telling you to turn right. When the compass heading is bracketed by arrow symbols, like this: **>122<** it means that you are exactly on course for the next way point.

You can order your driver to proceed to the next way point by pressing the **A** key. Keep in mind that this feature always goes to the next way point, regardless of where you are on the map. If you bypass a way point and drive several hundred meters past it, then press the **A** key, your driver will turn the tank around and return to that way point before going on to the next.

Tips for Successfully Driving Your Tank

World War II tanks varied widely in their performance capabilities. British infantry tanks like the Matilda II could achieve a mere 24 kph while the American M18 tank destroyer could reach 80 kph. Many of the mission scenarios in PANZER COMMANDER require you to achieve your objectives within a certain amount of time. You have to balance the tank's performance capabilities, fuel usage and the likelihood of an engine failure against this.

PANZER COMMANDER assumes that all of these vehicles have similar capabilities with respect to inclines. You can generally climb an incline of 45 degrees or less – albeit, very slowly. In addition, if the tank is rolled too far to the left or right due to its position on an incline, it can topple, leaving you stranded and ending the scenario.

While tanks are designed to traverse all sorts of rough terrain, it is best to drive on roads when they are available. Your tank is able to move faster over a road with less wear and tear. However, roads are obvious places for ambushes and the enemy takes advantage of this fact. Your tanks also have to go off road frequently in order to outflank an enemy holding a defensive position. Off road travel increases the risk that your tank will take damage to its wheels or treads. You need to reduce your speed under such conditions or risk the catastrophic failure of one of your tanks.

Rivers in PANZER COMMANDER are impassable. If you attempt to cross a river, the engine gets swamped and the treads get stuck, leaving you stranded and ending the scenario. To cross a river, you need to find a bridge. It's always a good idea to secure a bridgehead as soon as you can if you need to get across a river to achieve one of your mission objectives.

Finally, a note about evasion. A tank moving over open ground or at the top of a ridge line is a highly visible target. If you have to move over such terrain, do it as quickly as possible and try to dodge frequently. You may not know that an enemy has you in his sights until he fires; by then is too late for you to do anything about it. It is much better to find routes down gullies, behind hills and well back from exposed ridge lines. The less chance the enemy has of spotting you, the more chance you have of spotting him first and destroying him.

Commanding the Driver

While you may choose to drive your tank manually, you may also order the driver to proceed to the next way point using the **A** key. The driver then attempts to find the best route to that way point, looking for bridges as necessary to cross rivers and avoiding impassable terrain. When the driver is driving, you may increase or decrease the tank's speed using the up and down arrows or by pushing up or down on the joystick, but if you attempt to steer the tank using the left and right arrows or the joystick, the driver returns control to you and you are responsible for guiding the tank.

Operating the Main Gun

The tank's main gun is its most important and most formidable weapon. All WWII tanks depicted in PANZER COMMANDER have main guns capable of firing armor-piercing rounds at their enemies. However, the relative power of their main guns vary greatly from model to model, especially between early war and late war models. The German Tiger tanks, for example, gained their notoriety from the famed 88mm gun, which was more than capable of penetrating most armor of the day.

As the war progressed, armor thickness and quality improved, necessitating an increase in the bore sizes of tank main guns. Tank battles tended to be short and intense – especially when one side had a decisive advantage in armor thickness and main gun power. Early in the Soviet campaign, the Germans were frequently thwarted by the superior armor and larger guns of the Soviet T-34 and KV-1 tanks. Later in the war, British and American tank forces took fearsome losses going up against the superior Panther and Tiger tanks fielded by the Germans.

Armor-Piercing and High Explosive Rounds

Although AP rounds were effective against tanks and reinforced bunkers, high-explosive rounds were much more useful against buildings, bridges and infantry fortifications. These rounds were similar to the high-explosive rounds fired by artillery pieces, though generally not as powerful. Some vehicles – most notably early war British tanks equipped with the "2-pounder" and "6-pounder" guns – were incapable of firing HE rounds, which put them at a disadvantage for certain missions. Others, like the Iosef Stalin series of Soviet tanks with their huge 122mm main guns were capable of devastating attacks with massive high-explosive shells.

PANZER COMMANDER attempts to accurately represent the availability of HE and AP rounds for each tank. In addition, the load outs vary from mission to mission depending on the scenario objectives. Supply problems may make it difficult to achieve certain mission objectives. In general, it's best to make every shot count.

The main gun is rotated along two axes for the purposes of aiming. *Elevation* is the vertical rotation of the gun barrel and directly affects the distance the shell travels. *Traversal* is the horizontal rotation of the tank's turret and affects the direction in which the shell travels. You aim the tank's main gun by traversing the turret and elevating the gun to lay the gun on its target. The following keys operate the traversal and elevation functions:

Keypad 4 – Traverse left
Keypad 6 – Traverse right
Keypad 2 – Increase elevation
Keypad 8 – Decrease elevation

In addition, you can hold down the **Shift** key to slow the traversal or elevation, allowing fine adjustment of the aim.

While you can control the traversal and elevation of the main gun from anywhere in the tank, the gunner's position and the gun sight view provide targeting reticles which allow you to aim the gun much more precisely. If you change to one of these views (using the **F6** and **F7** keys respectively) you also have the option of aiming the gun with your joystick. This can potentially be easier than using the keyboard, but it is a matter of taste.

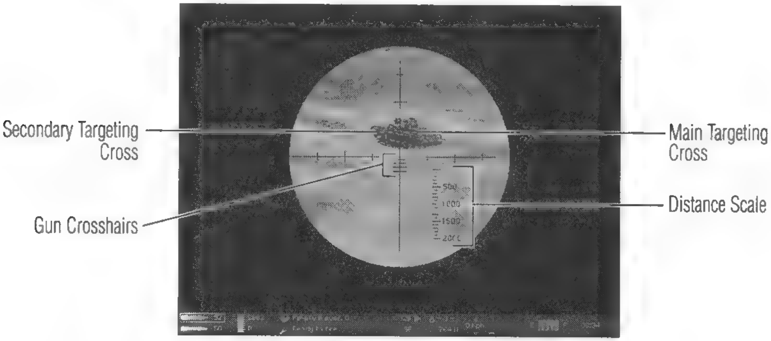
Before we discuss how to lay the gun, you should understand how target selection works. When enemy units appear, one is marked with a red cross. This is the selected target. Target selection serves three functions: first, it allows you to identify the enemy units in your field of view. Second, it gives you the ability to identify targets to assign your gunner and other platoon members. Third, and most importantly for this discussion, it serves as a sight indicator for your range finder.

We'll discuss the first two uses of the target selector in the sections on *Commanding Your Gunner* and *Issuing Platoon Orders*. For now, we'll concentrate on selecting targets.

If more than one enemy unit is in your field of view, you can select each in turn using the **Tab** key. You can return to the first target by continuing to press the **Tab** key until the selection indicator marks that unit. You can also use the **Caps Lock** key to cycle backwards through the list. The **N** key selects the target nearest your tank, while the **S** key selects a target that is in your gun sight. Naturally, you need to be in either the gunner's position or the gun sight view (**F6** or **F7**) to use this command.

Normally, the target selector only marks enemy units that are within identification range of your tank. However, the **S** key allows you to target objects which are outside of identification range or which are not identified as enemy units, such as buildings, trees and the like. This can be handy if you need to blow up a building for some reason, or if you want to use your range finder to dial in your gun sight to a particular area.

The range finder is integral to the gun sight view and allows you to accurately determine the distance to a particular target. Distant targets may require you to raise the elevation of the gun in order to compensate for the distance the shell drops over time, otherwise, your shots will fall short of the target. With the range finder, you can determine how much to compensate for the distance, allowing you to accurately lay the gun on the target.



Using the Range Finder

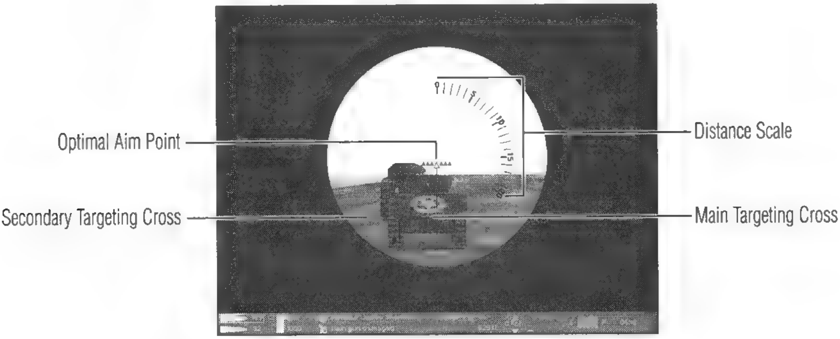
Using the range finder is fairly straightforward, but may require some practice. If you have used an old style "range finder" camera this procedure should be pretty familiar to you. There are two parts to the range finder gauge. The first and most obvious is a numeric scale in the lower right or upper right quadrant of the gun sight which includes a red needle that moves up and down when you change the range setting. This shows you the range to the target when set properly. It is marked off in hundred meter increments between zero and two thousand meters.

The other part of the range finder is a little trickier. When you look through the gunsight you see that targets which have been identified bear two of the distinctive green or red targeting crosses rather than the single cross you would see in any other view. The second cross is a darker shade and appears to the left or right of the main targeting cross, depending on the range finder setting.

To determine the range to a target, use the **Page Up** and **Page Down** keys to increase or decrease the range finder setting. Note that these are not the **Page Up** and **Page Down** keys located on the numeric keypad, but those located to the left of the keypad on extended keyboards. If your joystick is equipped with a "hat" switch, you can also use this to adjust the range finder setting. When you do this, the second cross moves to the left or right. When the darker cross lines up behind its mate, the range finder has been dialed in for that target. All you have to do now is note the position of the red needle in the distance scale and you have the range to your target. If you have more than one target in your sight, you can quickly determine the range to each by lining up its two targeting crosses.

Now what do you do with this information? This depends on your gun sight layout, which varies depending on which country's tanks you are driving.

For American and British tanks, gun sight cross hairs indicate the direction your shell is fired. Lining up the target with the main cross hairs would score a hit every time if shell drop were not a factor. Below the main horizontal cross hair is a series of four smaller horizontal marks which cross the main vertical cross hair. These correspond to distances of 500, 1000, 1500 and 2000 meters and are calibrated for the current ammunition load set for your main gun. Use these marks to compensate for distance. For example, if you have determined that your target is 1000 meters away, line it up with the second of these marks instead of the main horizontal cross hair. Once you have the target lined up, pressing the **Space Bar** or **Joystick Button 1** fires the main gun.



For German and Soviet tanks, the targeting reticule located at the center of the gunsight moves up and down with the range finder setting to show the optimal aim for a target at that range. To hit the target, all you need to do is dial in the proper range setting and line up the upper tip of the center triangle with your target and fire. The smaller triangles to the left and right are provided as reference marks to help you lead a moving target. The targeting reticule is calibrated to your current ammunition selection. Note that since high-explosive rounds have a lower muzzle velocity they require more elevation correction than armor piercing rounds. Again, once you have the target lined up, pressing the **Space Bar** or **Joystick Button 1** fires the main gun.

United Effort: Soviet Propaganda poster showing the importance of the worker to the war effort.

If your first round misses it is often because it falls short of the target. This is why the gun sight is provided with a range finder and graduated cross hairs, to help you adjust your aim. In general, the further the target the higher the required elevation. Getting it right the first time takes practice, but can make the difference between surviving a battle and getting shredded by enemy fire.

Several things can happen when you fire a gun, depending on the target and the type of round fired at it. If the target is an armored vehicle, a high explosive round will probably not destroy it, but may cause some damage depending on where it lands. A thrown tread or damaged road wheels can partially disable a tank, but it will still shoot back at you if it can.

An armor piercing round will probably destroy a tank – if it penetrates the armor. This can be a big *if* depending on what type of vehicle you are commanding and what kind of target you are shooting at and on the range and position at which you are shooting. Most tanks are more vulnerable in the sides and back than in the front. If you are in an M4A3 Sherman and your target is a Tiger, you want to try and outflank him to get off a side shot or ambush him to get off a rear shot. Dueling toe-to-toe in this situation is not advised as your AP rounds are likely to just bounce off his formidable front armor. Of course, at point blank range you probably have a chance, but you probably won't be able to get that close.

Armor damage is not cumulative: a shell either penetrates or it does not. If it does not, the armor's effectiveness isn't reduced in any way. If the shell penetrates, the target will probably be destroyed, but if it isn't, the armor effectiveness on the side that is hit *is* greatly reduced. A second shot in the same place will certainly destroy the target.

While armor piercing rounds can destroy most soft-shelled vehicles, you're probably better off using your coaxial machine gun for such targets and reserving your AP rounds for more deadly foes. AP rounds also damage buildings, but often they simply poke holes in them. Use your high-explosive rounds on these targets or your coaxial machine gun, which cumulatively damage the target until it collapses. Once a round is fired, your loader automatically feeds a new round of the same type into the main gun.

Changing Ammunition Types

If you want to change what type of round is being loaded into your main gun, use the **G** key on the keyboard to toggle between AP and HE rounds. The best time to change loads is immediately after firing the main gun. This allows the loader to avoid wasting time loading a round that isn't desired. If you ask the loader to change loads *after* a new round is ready to fire, it may take him up to twice as long to unload the old round and reload a new one. While you may want to do this if you are low on ammunition or if there is no particular danger, it might make more sense to fire the round that's already loaded at a target of opportunity and *then* order a different load.

The status bar displays information about ammunition to the far left. There are two icons here representing the different types of shells; the one with the white tip represents high-explosive rounds while the other represents armor-piercing rounds. ***Historical Note:*** *This scheme was actually used by German tankers in World War II. Shells painted with a white tip were used to distinguish high-explosive rounds.* Next to each icon is the number of rounds of that type remaining. If the number of rounds goes to five or less, the number turns yellow, warning you that you are low on ammo. At zero, the number goes red, indicating that you are out of that type of ammo. When this happens, your loader starts loading from the remaining ammunition type.

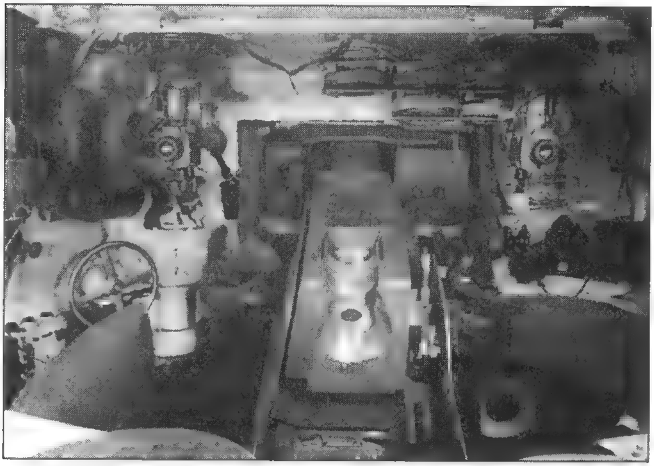
Limitations on Targeting

Occasionally you are unable to lay your gun on a target. Usually this is because the main gun has a limited range of elevation and cannot be elevated or depressed enough to sight the target. The only things you can do in a case like this is to move your tank to a more favorable vantage or wait for the target to move into range of your sights. This can be very frustrating if you have found a good "hull down" position and can't take advantage of it. Experience teaches you the best positions to assume for certain target angles.

Tank elevation and traversal speed can vary widely from model to model. Though the Germans had some of the most powerful guns in their late war tanks, speed of elevation and traversal on these vehicles was only mediocre, while the American tanks, though under gunned, could lay their main guns on the target more quickly. The best strategy is to learn your vehicle's strengths and weaknesses and make the most of them.

Moving and Shooting

Unlike their modern counterparts, World War II tanks had no functional gun stabilizing systems, though some efforts were made in this direction. Without such a system, traveling down rough terrain and accurately aiming the main gun is pretty impractical. You may waste a lot of ammo proving this to yourself, but your enemies won't. Most successful commanders adopt a strategy involving quick dashes between cover punctuated by some moments completely stopped to allow the gunner to track the target.



Close Quarters: The cramped interior of a T-34 tank.

Commanding the Gunner

While it can be very satisfying to lay the gun on enemy targets and blow them away, the commander must assume overall responsibility for the tactical situation. An evolving situation may not leave you with enough time to aim the gun *and* issue orders to other crew and platoon members.

Your crew includes a gunner who is quite capable of aiming the main gun with a fair amount of accuracy, which improves over time the longer he survives. It is your responsibility to pick targets for him, order the gun load (AP or HE) and issue the fire order. It is his responsibility to keep the gun tracking the target until ordered to fire. He does so until you order otherwise or until the target passes out of view, even when the tank is moving.

Use the target selection mechanism to pick a target for your gunner. This is discussed in detail in the previous section. To summarize, the **Tab** key and **Caps Lock** key cycle through the available targets, while the **N** key selects the nearest target and the **S** key selects the target in your gun sight. To order your gunner to track and shoot the selected target, press the **T** key.

The status bar located at the bottom of the screen contains some valuable targeting information. First, the gun sight icon tells you the status of the main gun. When it is green, the gunner has no target and isn't tracking anything. When it is yellow, the gunner is traversing or elevating the main gun. When it is red, the gunner has the target in his sights and is ready to fire.

Next to the gun sight icon is the target indicator, which is a text description of the selected target. This can be very useful when prioritizing your fire for the most dangerous targets. Note that this space is shared by the way point indicator, which can momentarily replace the targeting indicator when you switch way points. If this happens, you can restore the target indicator again by pressing the **Tab** key.

When the gunner reports that he is ready to fire, you should press the **Space Bar** or **Joystick Button 1** to fire the main gun. If the target is destroyed, the gunner centers the gun and awaits new firing orders. If not, he continues tracking the target until it is destroyed or until you order otherwise. You can manually order the gunner to center the main gun (the normal position for travel) by pressing the **Keypad 5** key.

You can issue orders to the gunner from any position in the tank – provided you can see the targets to select them and assign them. If you override the gun traversal or elevation manually, the gunner relinquishes control of the main gun to you until ordered to do otherwise and any targeting order you issued before is canceled.

Operating the Coaxial Machine Gun

Most tanks come with a machine gun mounted coaxially with the main gun – that is, they share the same mount and can be traversed and elevated simultaneously. This gives the tank commander an additional weapons option that allows him to save valuable AP and HE main gun rounds for more appropriate targets.

The coaxial machine gun is most effective against soft-skinned vehicles like trucks or personnel carriers and against unfortified structures like houses and other buildings. It can also be effective against machine gun nests and other light infantry fortifications.

You aim the coaxial machine gun using the same key commands and joystick movements as the main gun. The only difference is that you use the **Left Control** key to fire the coaxial machine gun. The machine gun fires continuously as long as you hold the **Left Control** key down. You may have to do this for a while for stubborn targets.

In the status bar next to the section denoting main gun ammunition, there is a machine gun belt icon with two numbers next to it. The upper number is the number of rounds left for the coaxial machine gun while the lower number provides the same information for the hull-mounted bow machine gun. The machine gun can rapidly deplete its store of ammunition, so short, controlled bursts are recommended.

You may also order the gunner to track a target on which you want to use the coaxial machine gun. Use the same technique as described above for the main gun, just use the **Left Control** key to fire the machine gun.

Issuing Platoon Orders

As platoon leader your responsibilities increase to encompass operations involving one or more additional tanks whose efforts you have to coordinate. Don't panic – PANZER COMMANDER makes this simpler than you might think.

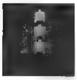
Your platoon members are more than just extra guns – they are also extra eyes and ears and can help you spot the enemy more quickly. Like the members of your tank crew, they gain experience and improve in performance over time. You therefore want to make sure that they stay alive too.

By default, your platoon members follow you around in column formation. To have them independently engage enemy targets as they are spotted press the **E** key.

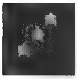
Changing the Platoon Formation

While the default column formation is ideal for moving your platoon down a road through friendly territory, it may not be optimal tactically. For example, if you are attacked from the front, your tanks are poorly deployed to respond to enemy fire.

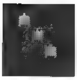
To change the formation, use the **F** key to cycle between the six different types of formations available to your platoon. The formation indicator in the status bar changes to show a graphical representation of the new formation. Keep pressing the **F** key until the formation you want is selected. The key to selecting the right formation is to anticipate the location of the enemy in relation to your path. What follows is a list of formations supported by PANZER COMMANDER and their tactical uses:



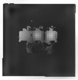
Column. As stated earlier, this is the best formation for moving your platoon quickly down a road. It is particularly disadvantageous if you are attacked from the front or the rear as half or more of your platoon won't be able to target the enemy.



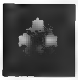
Echelon Left. In this formation your other platoon members line up in a diagonal to the rear and left of your tank. This is a good formation if you're expecting an attack from the left flank but need to advance on a position ahead.



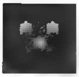
Echelon Right. This is basically the opposite of the Echelon Left formation and is useful if you're expecting an attack from the right flank.



Line Abreast. This formation is useful if you're advancing on an enemy position. However, if the enemy attacks from the left or right flank, you may find that the majority of your tanks are unable to return fire.



Wedge. This formation is a compromise for those situations where you're unsure of which flank an attack may come from. Your tank is at the point of the wedge while the others follow along two diagonals behind and to the left and right.



Crescent. This is the opposite of the wedge formation and may be useful for outflanking a concentrated formation of enemy units.

Assigning Specific Targets

By default your platoon members engage enemy targets of opportunity. This may not always be a tactically good situation. You may wish to concentrate one or more of your platoon members to specific high-priority targets. To do this, use the target selection keys to identify the target you want to assign; for details see the section titled, *Operating the Main Gun* starting on page 45. Then, while holding down one of the **Shift** keys, press either the **number** keys 1 or 2 (not from the numeric keypad) to assign a platoon member to the selected target. That tank's commander attacks the target until it's destroyed or until issued different orders. If the target is destroyed, the tank commander assigned to the target returns to engaging targets of opportunity.

The thanks of the people: Soviet tankers receiving decorations, 1943.

Engaging the Enemy and Holding Fire

Although most of the time you want your platoon members to engage any targets of opportunity, occasionally you may wish to sneak up on a target to gain the advantage of surprise. Pressing **H** orders all of your platoon members to hold fire. However, if fired upon your tank commanders may not maintain fire discipline and may proceed to return fire. You can cancel the hold fire order using the **E** key to issue the Engage command. All units in your platoon will then engage targets of opportunity. Note that issuing the Engage order cancels any specific target assignments.

Victory Conditions

Every mission scenario in PANZER COMMANDER has a set of victory conditions. These are objectives which you must complete in order to achieve victory in the mission scenario. Sometimes surviving the mission is all that's required, while other times you may have to destroy a number of enemy targets or defend a particular area.

Victory points are accumulated whenever you achieve part or all of an objective. For example, if you're ordered to destroy all of the units of a specific type, you are awarded points for each unit of that type destroyed. When the scenario ends, the number of victory points you have accumulated is evaluated to determine whether or not you have achieved a major victory, a minor victory or a loss. The following are objectives you may be asked to achieve in pursuit of victory in PANZER COMMANDER:

Destroy a Specific Unit

In this case you are asked to seek out a specific unit for destruction. You are awarded victory points for each vehicle or structure in the unit to be destroyed. Often your objective units are well-defended, requiring you to either destroy the defenders first or risk your platoon in an assault on the objective.

Counterattack: Soviet armor on the advance, 1943.

Destroy All Units of a Specific Type

These are usually classic "search and destroy" objectives wherein you seek out all units of a particular type – usually other tanks or perhaps a supply column. Victory points are awarded for each unit of that type which is destroyed.

Defend a Specific Unit

Here you are being ordered to keep a specific unit intact for the duration of the scenario. Victory points are awarded for each vehicle or structure in that unit which survives until the scenario ends.

Defend All Units of a Specific Type

This type of objective involves keeping as many units as possible of a particular type alive until the end of the mission. Victory points are awarded for each such unit that survives.

Reach a Specific Way Point

This may seem deceptively easy, but if it's listed as a victory objective, you can bet that the enemy is fighting you every step of the way. Here you are awarded victory points only if you reach the way point.

Protect an Area

This objective involves keeping the enemy out of a specific area. Points are awarded if there are no enemy units in it at the end of the time limit.

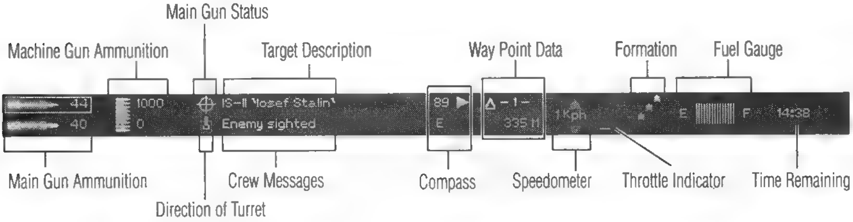
Survive

The lethal nature of tank battles is such that many times simply surviving to the end of a scenario is sufficient to achieve victory. The more members of your platoon who survive, the more victory points awarded.

Using the Status Bar

At the bottom of each simulation view screen there is a status bar which gives you valuable information about your tank, your platoon and any targets you may have in view. Learning to read the status bar is crucial to successfully operating your tank and commanding your platoon.

The status bar is broken down into a number of separate regions, each of which are discussed below.



Main Gun Ammunition Indicator

This shows the current load settings for the main gun and the machine gun. The two shell images to the left indicate your main gun load. The white-tipped shell represents high-explosive rounds while the other represents armor-piercing rounds. To the right of each shell is the number of rounds of that type left in your ammo store. This number turns yellow when ammunition gets low and turns red when ammunition is out.

The type of round currently loaded in your main gun is indicated by a rectangle surrounding one or the other ammunition indicator. When a round is fired or you order a change of load, this rectangle turns yellow to indicate that your loader is currently reloading the gun. When it turns green again, you can fire the main gun.

Machine Gun Ammunition Indicator

The machine gun belt icon indicates the ammunition status for your tank's machine guns. The top number is the ammunition count for the coaxial machine gun while the bottom number is the ammunition count for the bow machine gun.

Main Gun Status Indicator

The cross hairs icon next to the machine gun ammo indicator changes color to indicate the current status of your main gun in relation to the target currently assigned to your gunner. If the cross hairs are green, no target is selected, if yellow, the gunner is in the process of laying the main gun onto the target and if red, the gun is on target and ready to fire.

Target Description

Next to the target cross hairs is a text description of the currently selected target. Use the **Tab** key to change the target selection. This procedure is described in detail in the section titled, *Commanding the Gunner* on page 51.

Crew Message Indicator

From time to time your crew or one of the other members of your platoon informs you of events related to the operation of your tank or the command of your platoon. For example, the loader informs you when the gun is ready to fire and your driver informs you when you have reached a navigation way point. While these messages are presented as spoken audio, they also appear here as text.

Compass

The compass indicates the heading in which your tank is facing. The upper part of the compass shows the heading in degrees (0 to 359) while the lower part shows an abbreviation of the nearest cardinal direction (N, NE, E, SE, S, SW, W, NW.) Two arrows bracket the degree heading of the compass. These provide a relative direction to the next selected way point. To reach the way point, steer your tank until the arrows indicate that you are on course. When this happens, both arrows appear inverted. For example, if the course to the way point were 48 degrees, your compass would look something like this: >48<. Some missions don't have way points; in this case no arrows appear.

Way Point Data

The triangle symbol indicates the location of the way point data indicator. This is split into two parts, the upper part of which indicates the number of the currently selected way point and the lower number of which indicates the distance in meters to that way point. If the mission has no way points this area is blank.

Throttle Indicator

The throttle indicator shows you the current throttle setting for your tank. The indicator is essentially a bar graph which increases from the bottom up if you are driving the tank forward and increases from the top down if you are driving the tank in reverse. Normally the bar graph is displayed in green. However, if part of the graph is yellow or red then you are pushing your engine beyond its normal capabilities. If you run your engine like this for too long, you risk an engine failure.

Speedometer

The speedometer is just to the left of the throttle indicator and shows your tank's speed in kilometers per hour. In addition, above and below the speedometer are arrows which show you the current direction of movement, either forward or reverse.

Formation Indicator

This area shows a graphical representation of the current tank formation used by your platoon. It also shows you the current status of your tanks. If one of the indicators is yellow then the corresponding tank is disabled, but repairable. If red, then that tank is destroyed.

Fuel Gauge

This is a bar graph that shows your current fuel status.

Elapsed Time Display

A chronometer is provided which shows you the time remaining to complete your mission, in minutes and seconds.

Hitching a ride: Soviet infantry hop on to a T-34 to cross a river, 1944.

TANK TACTICS

World War II and the decade prior to the war saw the rapid development not just of tanks but the tactics used to employ them. 'Panzers', as the Germans call them, were instrumental in the blitzkrieg tactics of the early war, where rapid mobility and concentration of firepower were the keys to victory. Tanks were so successful and so feared that both Allied and Axis forces developed numerous weapons systems to counter them, including: rocket launchers, anti-tank guns and tank destroyers.

Unsurprisingly, the keys to successfully operating a tank platoon are to take advantage of the inherent strengths of the tank and to avoid its inherent weaknesses. In the following sections some of the key tactical issues are discussed.

Mobility

The tank's greatest strength is its combination of mobility and firepower. This provides a great deal of tactical flexibility, allowing the tank to quickly and decisively respond to changing battlefield conditions.

Motion is one of the keys to victory. While it is sometimes useful to assume a defensive posture, often you may find that it's better to seek a more advantageous position from which to attack, even if you have to withdraw for a time. Mobility allows you to seek out and concentrate your forces against the enemy's weakest positions and, conversely, avoid those areas where he is concentrated in strength.

When you *are* forced to counter a strong enemy, your mobility makes you a more difficult target to hit and allows you to outflank him, giving you access to his more vulnerable side and rear armor. In many cases your armor is insufficient protection – this is especially true of many American and British vehicles. However, superior mobility can allow you to employ hit and fade tactics that allow you to successfully defeat a more powerful enemy.

The Firemen: German Armor racing to cut off yet another Allied break-through.

Armor

The strongest armor on nearly every tank is the front armor. Often, front armor thickness exceeds side armor thickness by a factor of two and top armor thickness by as much as a factor of ten!

Obviously it is best to keep your front armor towards the enemy as it more effectively deflects incoming fire. Furthermore, you want to avoid attacks on your flanks since in most cases an armor-piercing round to your side armor will penetrate, killing crew members and damaging or destroying your tank.

The best way to deal with a flank attack is to turn to present your front armor towards the attack. However, if this exposes a different flank to enemy fire, it may be necessary to withdraw in order to preserve your forces. The best way to withdraw, of course, is to back away, keeping your front armor towards the enemy and continuing to fire as you withdraw. Turning around and running while under fire is usually a bad idea.

Conversely, when attacking enemy armor, you should seek to attack his more vulnerable side or rear armor. Of course, he will attempt to face you with his front armor, so the element of surprise may be necessary.

First Shot Advantage

Getting the first shot in can mean the difference between victory and an unmarked grave. A lot of factors can affect the speed with which you can bring your weapons to bear on enemy targets. The ability of your gunner and the inherent speed of traversal and elevation of your turret and gun are big factors. However, these can be mitigated by having good positioning on the enemy units. For example, if the enemy is ahead of you and you have come up on his flank, your weapons are already much closer to the correct alignment. In fact, even if he has superior traversal and elevation speed, your gunner should still be able to get off a first shot pretty easily.

If it comes down to trading shots, your loader becomes much more important. A good loader cycles new rounds more quickly than a poor one and this can make all the difference in a fire fight.

The best way to get the first shot advantage is probably to lay an ambush for your enemies. This entails skillful maneuvering, knowledge of the terrain and good timing.

Weapons Capabilities and Limitations

While your main gun is your most powerful weapon, it is not always the most appropriate. Use your machine guns on soft-skinned targets to conserve main gun ammunition. You need it for more dangerous opponents.

Knowledge of your enemy's armor rating and weapons is indispensable when evaluating tactical options. If you know that your main gun will probably not penetrate his front armor, there are a few different things you can try:

- You can try for the flanking shot with the aim of penetrating his side armor. This may not be practical if he has a good firing position. He might well be able to cover his flanks and might even be free to turn his best armor towards you no matter the angle from which you try to attack.
- It may be possible to get closer using intervening terrain or structures for cover. As the distance decreases even weaker guns have a better chance of penetrating tough armor. However, this can be an extremely dangerous tactic for obvious reasons.
- If you have superior numbers you may try to overwhelm the enemy with an assault. With enough speed and enough luck some of your tanks can get through to deliver close-in flanking shots that are likely to take him out. A green enemy unit might even withdraw, possibly leaving you in a better position to press the attack.
- You can also try damaging the enemy tanks so that they are either immobilized or unable to return fire. Firing high explosive rounds or armor piercing rounds in proximity to his treads may cause some damage to his wheels, treads or suspension, leaving his tank unable to move. This gives you the option of then bypassing these enemy units or using your greater mobility to gain a flanking position.

Making Use of Terrain

All other things being equal, the best way to protect your tank from enemy fire is to find what is known as a good "hull down" position. Being hull down essentially means having the lower part of your tank hidden behind some terrain feature like a hill or the lower end of a gully. This positioning protects the majority of your tank from enemy fire yet leaves you free to return fire. This is functionally equivalent to digging a foxhole as an infantryman.

Even a slight rise can provide a useful hull down position if you make proper use of it. The best way to assume a hull down position is to use the gunner's position to evaluate your field of fire. Drive until you can just see from the gunner's position over the rise you wish to use as cover and stop there. Make sure your gun can depress far enough to give you the field of fire you want. This is important! If you can't hit the enemy on the other side of the rise then your hull down position isn't very useful and can just as quickly turn into a trap.

A depression can actually make for a better hull down position than a rise. This allows you to position your tank on the far side of the depression facing slightly downward, rather than on the far side of a rise facing upward. Why is this an advantage? Because your main gun usually elevates to a much greater degree than it depresses. On the back side of a rise, your tank is pointed slightly upward, forcing you to depress your gun further to hit targets on the other side of the rise. On the far side of a depression with your tank facing slightly downward, you must elevate your gun more to hit targets beyond the rim. Because your gun can elevate higher, you have a much better arc through which you can fire.

Terrain features also allow you to hide your tanks completely from enemy sight, allowing you to lay in ambush, retreat without taking excessive losses and sneak up on an enemy position. By choosing your ground properly you can even force the enemy to divide his forces, leaving him more vulnerable to your weapons.

Dealing with Artillery and Air Strikes

The greatest danger to a tanker from an artillery strike is the possibility that an incoming round will land directly on top of the tank, severely damaging the relatively weak top armor. This is pretty unlikely (but still possible); it is more common that artillery shells landing in close proximity damages your wheels or tread, leaving your tank immobile. Still, it's not much fun to be caught in an artillery strike, so you probably want to avoid them if you can.

If you do find yourself in the middle of one, don't panic. Most bombardments won't last too long. One way to get out of a strike in progress is to observe the pattern of the shells as they land to get a feel for where they are likely to fall next. This gives you some idea of where to move your tanks to get away from it.

Of more serious threat to tankers are aircraft bearing anti-tank cannon. These planes are designed to attack the weak roof armor of tanks with their oversized (for aircraft) guns.

There's precious little you can do about this. You can try and take cover under trees or in deep gullies, but there are few places that a plane cannot reach. You can try running, but planes are much faster than your tanks, so the best you can probably manage is to dodge them until they run out of fuel or ammunition. You can try shooting them down with your machine guns or even your main gun, but this outcome is wildly unlikely.

Fortunately, aircraft have little endurance and are often called off to attack other targets, so you have a good chance of surviving an air strike if you stay cool. For more information on the capabilities and vulnerabilities of the aircraft and anti-tank guns you can encounter in PANZER COMMANDER, see the section *Descriptions of Enemy Ordnance* starting on page 108.

Under fire: German infantry taking cover, 1942.

Attacking Fortifications

Other tanks are not the only threat you are asked to deal with. Often you are faced with stubborn defenses manned by infantry who are equipped with anti-tank weapons. This may range from simple machine gun nests to hardened concrete bunkers. You often find emplacements of anti-tank guns dug into ridges or other commanding positions. Occasionally you even come across a hidden bunker, with infantrymen operating a Panzerfaust or bazooka. They all have one simple goal: your destruction. It is your job to make sure that they fail.

When attacking dug-in infantry, your best weapon is your main gun and the high-explosive rounds with which it is equipped. Armor piercing rounds are not generally as effective against infantry positions since they're designed to concentrate their energy in a very small area. Most tanks have high-explosive shells, but some are more effective than others. In general, the larger the shell the more powerful the explosion, so the tanks with larger guns have an inherent advantage when attacking fortifications. Some bunkers are hardened to be resistant to attacks with high-explosive rounds. It may be more effective in this case to use your armor-piercing rounds to "crack" these bunkers instead. Unless you're dealing with a concrete bunker, however, you're better off reserving your armor-piercing rounds for enemy tanks.

Your machine guns can also be useful allies against weaker fortifications. In urban or village fighting infantry often take cover in buildings, many of which can be brought down by sufficient machine gun fire, or by running them over.

For more information on the capabilities and vulnerabilities of bunkers and other fortifications you can encounter in PANZER COMMANDER, see the section *Stationary Gun Emplacements* starting on page 115.

Panzers in the Snow: A column of German armor awaits the order to advance, 1943.

■ USING THE SCENARIO EDITOR

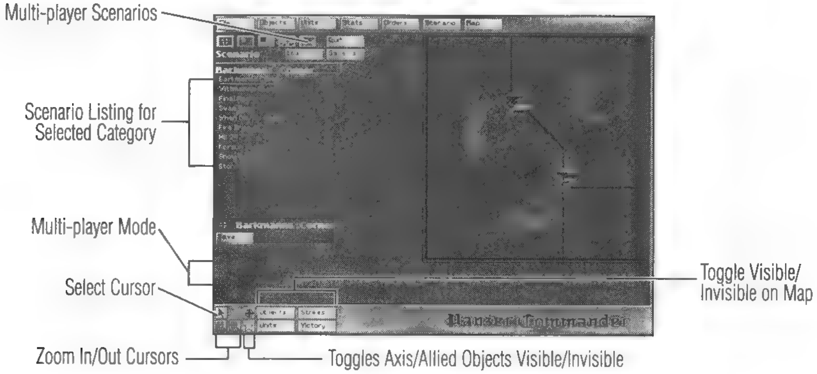
One of the most exciting features of Panzer Commander is the ability to create or customize scenarios to your own specifications. If you want to recreate battles from history, interesting "what if" scenarios, or just exciting fictional battles, open the PANZER COMMANDER program folder from your Windows 95 Start button and click on the Scenario Editor icon. When the Scenario Editor loads, there is a row of buttons across the top edge of the screen. These are, in order, File, Objects, Units, Stats, Orders and Scenario. These buttons select which control panel is currently visible on the left side of the screen, and are each covered in detail in the following pages.

Along the bottom edge of the screen is a control bar with another cluster of buttons. These buttons all allow you to manipulate the view while you are in the Scenario Editor. Starting from the left side, the first two buttons are Zoom Out and Zoom In. If you click on Zoom In and click anywhere on the map area, the view focuses on that area, magnifying it. If you click Zoom Out, the view pulls back to reveal more of the map. There are six levels of magnification that the map can be viewed at. Even when pulled back to the widest view, the map is too large to be seen in its entirety. To view the off-screen portions of the map, use the **arrow** keys to scroll the map.

The next six buttons control information the map shows. If the button is highlighted, then the map displays information of that type. The two small buttons to the right of the Zoom In and Zoom Out buttons are Show Axis Units and Show Allied Units. When these are highlighted, all units belonging to the corresponding side are visible. The other four buttons are as follows: Objects displays all objects that are not units; Units displays all tanks, trucks, AFV's, AT Guns, and infantry emplacements; Strikes displays all off-map artillery strikes and bombing missions; Victory displays all victory condition markers.

The last button on the bottom control bar clears the feature you are currently using and resets your pointer to the pair of brackets used to manipulate the position of objects on the map. To move an object on the map, click on it, drag it to the new desired location, and release the mouse button. If you click on an object on the map, a pair of brackets appears around the object, indicating that it is the current active object. A small red triangle appears adjacent to the active object that indicates which direction the object is facing. A ø symbol indicates that it is a wrecked or destroyed model. While using the editor, the **Left Control** key is used to activate additional options. If you hold down the **Left Control** key and click on an object on the map, it cylces through the different facings (clock-wise) and the destroyed object/unit settings.

Loading and Saving Scenarios


Multi-player Scenarios
Scenario Listing for Selected Category
Multi-player Mode
Select Cursor
Zoom In/Out Cursors
Toggles Axis/Allied Objects Visible/Invisible
Toggle Visible/ Invisible on Map
Panzer Commander

To load an existing scenario into the editor, click on the File button at the top of the screen so that the File control panel appears on the left side of the screen. Whenever you enter the scenario editor, this is the control panel that is first visible by default. When the File Control panel appears, there is a row of five buttons across the top of the panel. These buttons select the nationality of scenario you wish to edit, and are, in order: German, Soviet, American, British and Multiplayer. While Multiplayer is not a nationality, it is the only type of scenario which more than one human player can play in simultaneously.

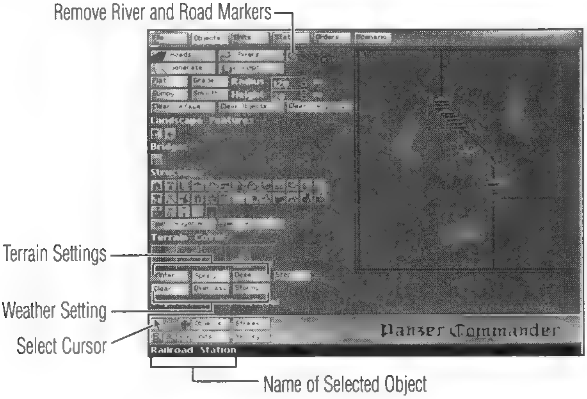
If you click on Multiplayer, four more buttons appear near the bottom of the panel that allow you to choose the different multiplayer modes. Melee mode is a free for all with the winner determined by whichever player has the most kills when the time is up. Team mode allows you to divide the players into two teams, Axis and Allies, again with the winner being determined by the team with the highest total kills. Platoon mode is a duel to the death between two players, each controlling an entire platoon. Flag selects Capture the Flag mode. In this mode, the players are divided into Axis and Allies again, but kills do not determine the winner. The winner is the first team to have a tank reach the enemy headquarters. In all multiplayer modes except Platoon mode, the scenario is limited to six players. In Platoon mode, you may only have two players.

If you click on a nation, click on the text box and type the name of the scenario you wish to load, or click on the name of any scenario on the list below the text box. The scenario list can be scrolled up or down using the Windows-style scroll bar. After you have entered the scenario's name, click on the Load button. After the scenario loads, the name and nationality of the scenario appears near the bottom of the panel, just below the scenario list.

After you have made any desired changes, you can save the scenario. To save the scenario to the file name that currently appears below the scenario list, simply click on the Save button. To save the scenario to a different file name or to save the scenario when no name appears below the scenario list, click on the text box, enter the new scenario name and click on the Save As button.

When you are finished in the scenario editor, you may exit the editor and return to the desktop by clicking on the Quit button.

Creating the Terrain



To create or modify terrain in a scenario, click on the Objects button at the top of the screen to bring up the Objects panel on the left side of the screen. If you wish to create new terrain across the entire map, click on the Generate button. This clears all previous elevation information and replaces it with random terrain. The severity of the terrain is determined by the number entered in the Height value of the Objects Panel.

To create more specific or localized terrain, click on the Sculpt button. PANZER COMMANDER features a "push/pull" style of terrain building, where if you pull up a point of terrain, the terrain around that point is also pulled up to a lesser degree. The amount of area this feature affects is controlled by the Radius value on the Objects Panel. The amount of height you add or subtract with each mouse click is determined by the Height value.

***Hint:** For natural hills and depressions, it is best to keep the height value to a number from -10 to +20 meters and the radius to less than 400 meters.*

To create rough terrain over the entire map, click on the Bumpy button. Again, the severity of the terrain is determined by the Height value. Unlike the Generate button, the Bumpy button does not clear the previous terrain, but instead applies a bumpiness to the existing terrain. When you have finished roughing up the map, you can also get rid of the more angular and choppy terrain by clicking on the Smooth button. This makes the elevation changes on your map more gradual and more natural. The Smooth button may be used multiple times to get the desired effect.

***Hint:** When using the Bumpy button, it is best to keep the height value to a number from +5 to +15 meters, otherwise the terrain is so rough that tanks may have trouble traversing it.*

Adding Roads and Rivers

Roads and rivers are made up of a string of connecting segments. To create roads, click on the Road button, and then click anywhere on the map to begin a road segment. To end the current segment and begin a new one, click on the map again. The road feature remains active, so you can continue in this way, clicking on the map every time you wish to end a segment and have the road turn in a different direction. When you are done plotting out the current set of road markers, either click on the road button again, or click on any other feature. Your road markers now appear as a thin black line, but are not currently visible in the simulator. If you are happy with the placement of your road markers, you can now click on the Grade button. This makes the road texture appear wherever you have placed road markers, and also indents the road into the ground, smoothing it out in the process. Use this process after clicking the River button for the creation of rivers. The Grade button also levels the ground beneath buildings so that edges do not hang out into the air. If you wish to remove the river or road markers, click on the "0" button. This removes all markers so that they are not graded further, but leaves the actual texture and graphics of all rivers and roads you have graded so far.

Hint: *When you grade rivers or roads, they indent themselves into the terrain, especially rivers. Every time you grade, this indentation increases. Unless you want super steep canals, it is best to grade sparingly, perhaps once after you have placed all river and road markers, and again after you have finished placing all buildings. Also, try to avoid ninety degree turns when placing river or road markers as these tend to look less natural.*

Adding Weather and Terrain Covers

In Panzer Commander, the terrain can be set to represent the Desert of the North African campaign, the Steppe of Russia, or the Winter or Spring of Europe. The default terrain set is spring, but to change it, click one of the terrain buttons near the bottom of the Objects panel. To further reinforce the feel of the setting you have chosen, directly below the terrain type buttons are the weather settings. Click on Clear for a clear day with no fog effects, Overcast for a light cloud layer with some haze in the air, or Stormy for a dense cloud cover with heavy fog effects.

Directly above the weather and terrain type buttons are the terrain covers. These are a set of five textures that can be used to modify the basic texture of the terrain and affect the movement of all vehicles. The exact names of each terrain cover vary depending on the current terrain type, but are identical in their effect in the game. The first button represents a slick or muddy texture that makes it difficult for tanks to find traction. The next button represents a lightly bumpy texture. The middle button is the smooth texture that is the default for the map. The next two textures are increasingly bumpy and slow all movement across them.

Sometimes it is useful to clear certain aspects of a map currently under construction. To remove all surface textures, click on the Clear Surface button. To remove all objects on the map, click on the Clear Objects button. Note that clear objects also removes all walls, hedgerows, and river and road markers. To return the map to a single, even elevation, click on the Flat button. The elevation that the map is leveled to is set by the Height value. To return to the default elevation that the map is set to when the Scenario Editor first appears, set the Height value to 25 meters.

Placing Non-Unit Objects

The Scenario Editor includes a number of trees, shrubs, and rocks. Click on the appropriate Landscape Feature to select that object type. Click anywhere on the map to place that feature there. The currently selected landscape feature remains active until you select a different type of feature. To 3D-preview the current object, press the **Left Control** key while the object is selected. To create an area of forest, reset the mouse pointer so that the brackets appear that allow you to manipulate objects on the map. You can do this by pressing the arrow pointer icon at the bottom of the screen. Then, hold down the **Left Control** key, click on any tree on the map, and drag the mouse to set the size of the forest section. This creates an indestructible wall of forest that blocks all movement.

As rivers cannot be crossed by tanks, you also need to place Bridges so that vehicles may pass over the water. The bridges that may be chosen appear directly beneath the Landscape Features. Bridges can be 3D previewed.

Hint: *When you place any object or unit, a red arrow appears showing what direction the object is facing. By default, this direction is north. To change the direction, hold down the* ***Left Control*** *key and click on the object. It rotates clockwise through each of its four facings. This way, units and bridges may be faced so that they are useful.*

To place Structures, click on one of the icon buttons beneath the Bridges, then click anywhere on the map. Remember that after you finish placing structures, you should grade so that the buildings appear flush to the ground. Structures may also be 3D previewed.

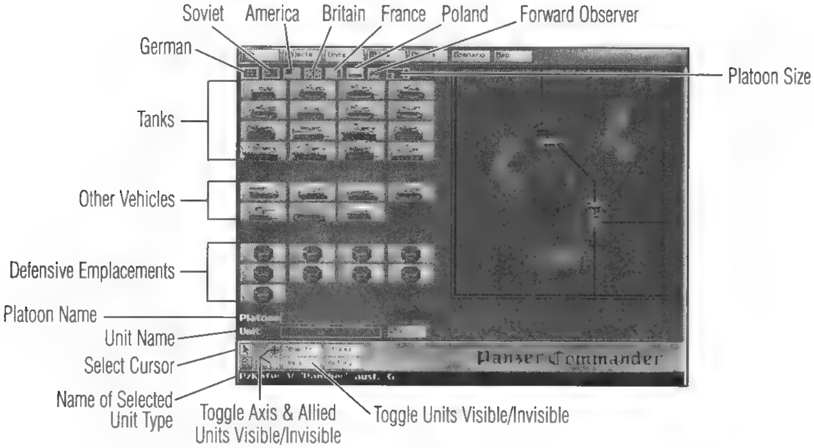
Hint: *To offset the buildings from the rest of the ground, try placing just a couple of squares of a different terrain texture directly beneath the building. Also, it is often easier to get the physical relation of the buildings accurate if structures and any special terrain textures being placed beneath them are placed while the map is zoomed in to a high degree.*

Hedgerows and stone walls are placed in a way similar to rivers or roads. Click on the Hedgerows or Walls button and follow the instructions as though you were placing a river or road. The only difference is that walls and hedgerows do not need to be graded.

Hint: *Scenarios are better when objects are placed with a mind on cover and how they impact the overall tactics of the scenario. Hedgerows are useful for cutting off line of sight, while walls are lower and provide good cover to the hull while the turret still has a clear field of fire.*

To accurately place buildings on the map, it is recommended that you use the fifth zoom level. At that level, each square is twenty meters.

Placing Units



When you are ready to begin placing units, click on the Units button at the top of the screen. When the Units panel appears on the left side of the screen, you see a row of flag icon buttons across the top of the panel. Click on one of these buttons to make the list of vehicles and equipment from that nation appear on the Units panel. The nation buttons are, in order, Germany, Russia, America, Britain, France, and Poland. Immediately to the right of the nation buttons is the Forward Observer button. Click on this to place a forward observer anywhere on the map. The forward observer spots enemy units and reports this information back your forces. The forward observer's allegiance is the same as the unit nationality currently selected.

The vehicles available to each nation are as follows:

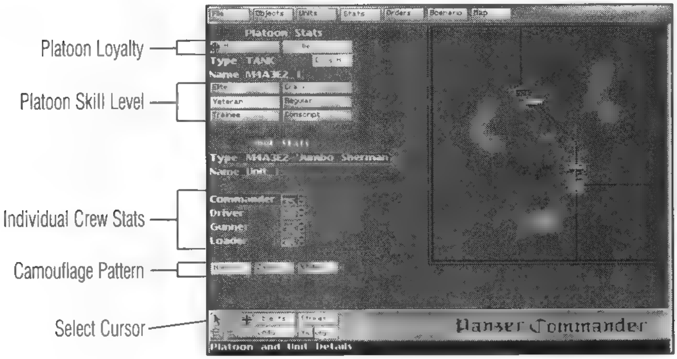
German:	*Skoda, Pz-IIIF, Pz-IIIG, Pz-IIIH, Pz-IIIJ, Pz-IIIL, Pz-IVF2, Pz-IVD, Marder, Pz-IVG, Tiger, Panther D, Pz-IVH, Panther A, Panther G, Pz-IVJ, Tiger II, Opel Blitz, Sdkfz 251/1, Sdkfz-231, Stug-IIIB, Jadgpanther, Hetzer, Stug-IIIG, SdKfz-234/1*
Soviet:	*BT-5, BT-7, IS-2, KV-1/41, T-34/41, T-34/42, T-34/43, KV-1/42, KV-1S, KV-85, T-34/85, BA-6, GMC, SU-85, SU-100*
American:	*M4A3, M4A3/76, M4A3E2, M4A3E8, M4A3E2/76, Chaffee, Pershing, Truck, M16, M2, M8, M10, M-18, M-36*
British:	*Matilda II, Crusader I, Valentine, Churchill IV, Comet, Cromwell I, Cromwell III, Cromwell IV, Cromwell VII, Firefly, Bren Carrier, Truck, Daimler, Sexton, Achilles, Sherman V*
French:	*R-35, Hothckiss, Truck*
Polish:	*R-35, Truck*

For detailed information about any of the tanks, see the appropriate nation's section in the *Tank Statistics and Capabilities* starting on page 73. For information on all other units, see *Descriptions of Enemy Ordnance* starting on page 108.

To place a unit, first click on a nationality, then on the desired unit, and then on the map to place a platoon of that type of vehicle. You can change the facing of the unit while it is selected; press the **Left Control** key and click again. The red dot indicates the "front" of the vehicle and a ø symbol means the vehicle is wrecked. To select the number of vehicles that appear in the platoon, change the number that appears near the top of the Units panel. Platoons can have from one to three vehicles. To change the platoon's name or an individual vehicle's name, select that unit on the map. To change the platoon name, you can click on any unit in the platoon, then click on the Platoon Name text box to edit the name. To change an individual unit's name, click on that unit, then click on the Unit Name text box to edit that name.

You can also change the vehicle types of individual units inside each platoon. To do this, click on the unit on the map you wish to change, click on the vehicle type you wish to replace it with, and click on the Change button at the bottom of the Units panel. Remember that only tanks can be swapped into tank platoons, and only non-tanks can be swapped into non-tank platoons.

Changing Unit Stats



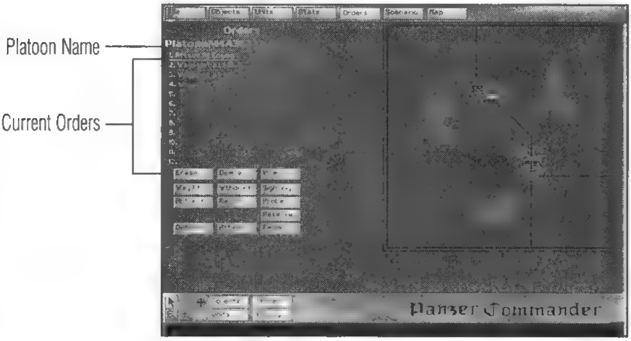
Once you have placed a unit on the map, you can change its stats by clicking on the Stats button at the top of the screen to make the Stats panel appear on the left side of the screen. The Axis button and the Allies button at the top of the screen allows you to select which side of the conflict each platoon fights on. This way, you can simulate captured equipment being used by the other side.

Just below these two buttons is the Comp AI button. If this is highlighted, then the unit is computer controlled. Units are set to AI control by default. To create a valid scenario, you have to set one tank platoon to human control by clicking the Comp AI button so that it is no longer highlighted. A scenario with more than one human controlled platoon is only valid if it is saved as a multiplayer scenario. This control only matters for tanks, since non-tanks are always AI controlled, no matter what this button is set to.

Below the Comp AI button are the buttons that control the overall skill level of each tank in that platoon. The levels of skill are, from least skilled to most skilled: Conscript, Trainee, Regular, Veteran, Crack and Elite. You can further adjust individual members of the crew in each tank by clicking on that tank and changing the numbers that appear under the Unit Stats section of the Stats panel.

Lastly, you can modify the camouflage pattern the tank appears with in the scenario by clicking one of the buttons that appear on the bottom of the Stats panel.

Assigning Platoon Orders and Way Points

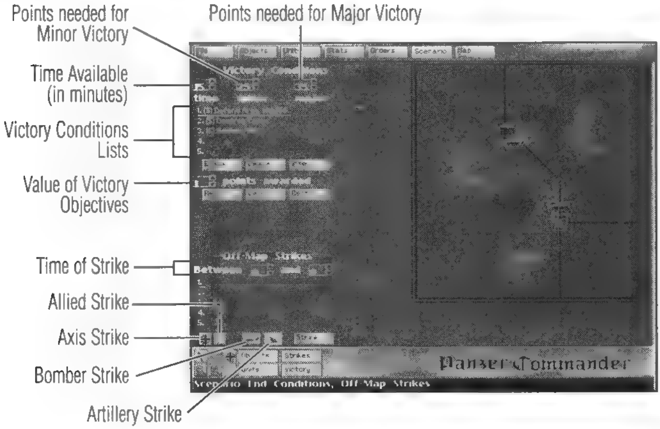


If you wish units to do anything other than sit where they are and shoot at enemies as they pass by, you have to supply them with orders by clicking on the Orders button at the top of the screen. The top half of the Orders panel shows the platoon's name followed by a list of the orders it is currently programmed with. All platoons start out with the default orders of Attack All Enemy. To change an order, click on any order on the list at the top of the panel. To erase the order but to leave the slot blank, click on the Erase button. To remove the order completely, click on the Delete button. To insert a command before the current command, click on the Insert button. To simply change the current command, simply select a new command from below.

Way Pt	Places way points on the map for the unit to follow.
Withdr Pt	Places a withdrawal point on the map. This is where the unit retreats to if broken.
Rpt Wpt	Repeats a way point so that the unit patrols the area.
Recon	Orders unit to reconnoiter the area.
Reserve	Orders unit to reserve mode until a certain event or amount of time has elapsed. You are prompted to give the conditions that the unit waits for, either until a unit type appears or a number of minutes elapse.
Defend	Orders unit to defend. You are prompted to select what you want the unit to defend.
Attack	Orders unit to attack. You are prompted to select what you want the unit to target.
Rush	Like Attack, but the unit does not stop to engage *any* enemy units until it reaches its last way point. Many tanks may not survive this order.

Hint: *Even though you are controlling the human controlled tank in the scenario, it is still a good idea to give the human controlled tank way point orders, as you are able to use these way points to navigate by once you are in the simulation.*

Setting up Air and Artillery Strikes


Points needed for Minor Victory
Points needed for Major Victory
Time Available (in minutes)
Victory Conditions Lists
Value of Victory Objectives
Time of Strike
Allied Strike
Axis Strike
Bomber Strike
Artillery Strike
Panzer Commander
Scenario End Conditions, Off-Map Strikes

To add off-board fire support, click on the Scenario button at the top of the screen, so that the Scenario panel appears on the left side of the screen. Near the bottom of the panel is an area labeled Off-Map Strikes. To add a fire support mission, first select which side you wish to have conduct the support mission by clicking on either the Axis button or the Allies button in the bottom-left corner of the Scenario panel. Then select either a bomber run or an artillery strike by clicking on the Bomber or Artillery button at the bottom of the Scenario panel. Next set the time you wish the strike to occur by adjusting the times listed just below the Off-Map Strikes header. Now, just click on the Strike button and click on the map where you want the strike to occur.

Victory Conditions

The last thing to do is set the victory conditions for the scenario. In each scenario, you only have a limited time to complete your objectives. This can be modified by changing the Time available in minutes at the top of the Scenario panel. Each scenario also has two victory levels, Minor (partial objectives met) and Major (objectives met). These point levels can also be changed at the top of the Scenario panel. When you have scored enough points to achieve a major victory, the scenario immediately ends; unless one of the victory conditions is "Defend Area", in which case the scenario ends when time runs out or all enemy vehicles have been destroyed. To set a victory condition, first set the number of points the objective is worth. Then, click on one of the three victory objective buttons:

For Reach objectives, click anywhere on the map. If one of your units reaches the marked area, you receive the listed number of points. You can change the size of the reach objective area by pressing the arrow-pointer icon at the bottom of the screen, holding down the **Left Control** key, clicking on a reach objective marker, and dragging the mouse to set the size of the objective area.

Barbarossa: German armor and infantry advance into the Ukraine, 1941.

For Defend, you have two options. For Defend Map, you are prompted to select any object on the map to defend. If this object survives, you gain the listed number of points. For Defend Area, you click on an area of the map in the same fashion as a reach objective, but you gain the listed number of points if there are no enemy units in the defend area at the end of the scenario.

For Destroy objectives, when you click on the button, you can select a specific object by clicking on the Map button and then clicking on an object on the map, all enemy units by clicking on the All button, or a category of objects by clicking on the appropriate button. In all these cases, you receive the listed points every time one of those objects is destroyed.

Scenario Creation Tips

The default height when the Scenario Editor first loads is 25 meters. The lowest elevation is 0 meters and the highest is 100 meters. Sculpt adds or subtracts the listed amount from the current height of the map. If you keep adding to the height, the upper elevations start to “plateau” once the height of terrain starts hitting 100m, and the reverse occurs once the terrain hits 0 meters, if you continue to try and lower the elevation.

Try to place objects in small, tight groups. Lone objects normally look silly once you are playing, but don’t over-populate an area either as this only slows down the game. This is easier to do if you place objects while zoomed in a good distance.

Forest sections look best when they are used as a backdrop to other structures rather than the primary object of attention. Also, they are large and impassable objects, so keep in mind how this affects movement in your scenario.

TANK STATISTICS AND CAPABILITIES

In addition to giving the statistics for the tanks in the game, this section discusses tank development throughout World War II, in an attempt to clarify the relative strengths and weakness of tanks from different countries at different periods of the war. To avoid confusion, emphasis is given to those tanks available for use in PANZER COMMANDER; other models or tanks types are mentioned only in passing.

Stats are given for every tank model in the game. They are listed in the order that follows:

Name of the Tank
Weight: (in metric tons)
Hull Armor: (front/side/rear)
Turret Armor: (front/side/rear)
Main Gun: (ordnance type)
Top Speed: (in kilometers per hour)
Crew: (the usual number of men for this vehicle)

German Vehicles

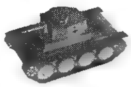
It is interesting to note that at the height of their early war successes, the German forces often found themselves operating tanks that were markedly inferior to those of their enemies. While this was true in France and in North Africa, nowhere was it more true than in Russia, where the Germans, operating Panzer II, III and IV along with Czech-built Panzer 38(t) were faced with the larger and more formidable Soviet T-34 and KV-1 tanks.

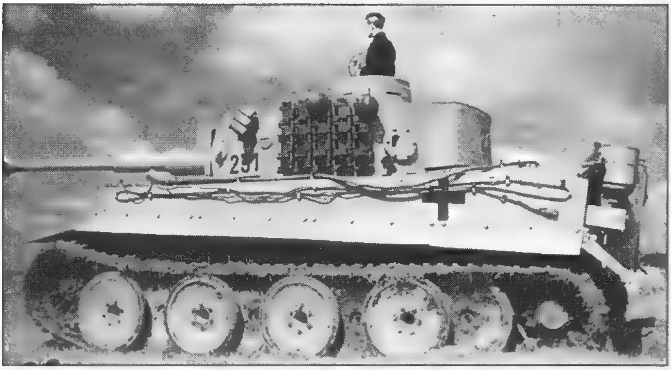
This single fact more than any other drove subsequent German tank designs and these early war models rapidly gave way to up-gunned Panzer IV, Panthers and the much vaunted Tiger I and Tiger II models. It also spurred the development of several Panzerjaeger and Jagdpanzer vehicles (literally "tank hunters", the German equivalent of tank destroyers) including the very successful Hetzer and Jagdpanther models.

Panzerkampfwagen 38t 'Skoda'

The Panzerkampfwagen (literally "armored fighting vehicle") 38(t) was the German designation for what was actually a Czechoslovakian tank built in the captured Skoda tank works. The Czechoslovak designed Armored Fighting Vehicle, was produced by/for the German military between 1938 and 1942. A total of 1411 Panzerkampfwagen 38(t) (versions A through G) had been built when production ceased in June of 1942.

Pz 38(t)A
Weight: 9.7
Hull Armor: 25/18/18
Turret Armor: 25/25/25
Main Gun: 37mm
Top Speed: 42
Crew: 4





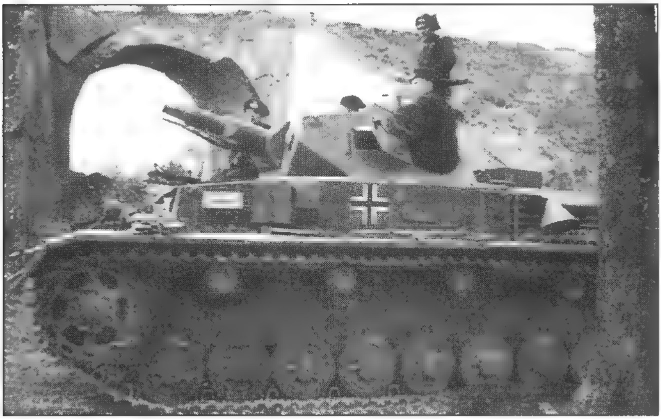
Overwatch: A Tiger's crew scans the horizon, Russia, 1943.

The Panzerkampfwagen 38(t) was held in high regard by German AFV crews for its excellent design and the durability of its transmission. While most German AFVs were designed well by highly skilled German engineers, they also tended to suffer from overly complicated designs - more parts to be assembled (meaning longer production times), and more parts to wear out and break down (making repairs and the organization of repair shops more difficult). This was far from the case of the Panzerkampfwagen 38(t), whose design was simple, easy to produce, reliable, and capable of handling increases in armor thickness and armament size.

As far as the durability of the transmission was concerned, some German AFV crews concluded that the Czech produced Panzerkampfwagen 38(t) chassis could safely accrue more than three times as many miles as its German designed and built counterparts before developing a desperate need for overhaul and maintenance.

The Panzerkampfwagen 38(t) fought in Poland, Norway, France and Russia (variants and conversions of the Panzerkampfwagen 38(t) fought on all fronts for the German armed forces for the entirety of the Second World War). As of June 1941, when Germany invaded Russia, roughly 25% of the entire strength of Germany's Panzer divisions consisted of some version of the Panzerkampfwagen 38(t).

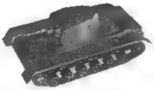
The variant available in PANZER COMMANDER is the **Panzerkampfwagen 38(t)A**. 150 of these were produced between May of 1939 and November of 1939. The crew consisted of four men (commander, driver, gunner and loader). They were armed with a 37L48.7 KwK 38(t) Skoda A7 and two 7.92mm MG37(t) (one co-axially, one bow mounted). The power plant was a 125 HP 6 cylinder Praga EPA. Armor thickness varied from 8mm to 25mm. Many rivets were used in the armor construction, which was very hazardous to the crew - a direct hit on a rivet head (you think this didn't happen?) would cause the remainder of the rivet to ricochet about the interior of the vehicle at very high velocities.



A PzKw IV crew rests and rearms, France, 1940.

Panzer III and Variants

PzIIIF
Weight: 20.3
Hull Armor: 30/30/30
Turret Armor: 30/30/30
Main Gun: 37mm
Top Speed: 40
Crew: 5



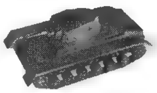
The Panzerkampfwagen III was produced by Germany between 1937 and 1943. A total of 5733 Panzerkampfwagen III (versions A through N) had been built when production ceased in 1943.

The Panzerkampfwagen III was the backbone of the Panzer divisions from the start of the Second World War through mid 1942. They fought on all fronts for the entirety of the Second World War, and were numerically the most important German AFV until this claim was taken over by the Panzerkampfwagen IV in 1943. The cause of this shift in importance was the ever upwardly spiraling gun/armor race - a race whose competition was fiercest on the Eastern front. The chassis and turret ring of the Panzerkampfwagen III could not accept the stress of carrying a high velocity 75mm gun. Due to this, it could no longer be considered a competitive main battle tank after 1942 (when the T-34 and KV-1 were appearing in increasing numbers on the Eastern front, where the vast majority of tank versus tank combat was taking place). However, the Panzerkampfwagen III chassis was by no means ever useless - it performed in many important roles during the Second World War, even after it was retired from duty as a front line main battle tank.

One important technological advance in the development of AFVs that found its start in the Panzerkampfwagen III was an intercom system for use by the AFV in combat. This allowed the AFV crew to communicate quickly and effectively with each other through microphones/headphones despite the extremely noisy environment that the inside of an AFV can be during combat (or at any time for that matter). The Panzerkampfwagen III was the first AFV design in the world to incorporate this idea, which subsequently became a standard feature on all German AFVs.

PANZER COMMANDER includes models F,G, H, J and L of the Panzer III series.

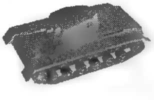
PzIIIG
Weight: 20.3
Hull Armor: 30/30/30
Turret Armor: 30/30/30
Main Gun: 50mm
Top Speed: 40
Crew: 5



There were 435 **Panzerkampfwagen III F** produced between 1939 and 1940. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner). The earlier vehicles which are represented in PANZER COMMANDER were armed with a 37L46.5 KwK 35/36 and three 7.92mm MG34 (two coaxially, one bow mounted), while later production vehicles were more powerfully armed. The power plant was a Maybach HL 120 TRM 12 cylinder engine rated at 265 HP. Armor thickness varied from 10mm to 27mm. During 1942-1943, some Ausf F were rearmed with a 50L60 KwK 39 as main armament. These vehicles saw front line service as late as June 1944 with the 116th Panzer Division in Normandy.

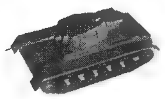
Between 1940 and 1941, 600 **Panzerkampfwagen III G** were produced. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner). Earlier vehicles were given a smaller main gun, while the later production vehicles available in PANZER COMMANDER were armed with a 50L42 KwK 38 and two 7.92mm MG34 (one coaxial, one bow mounted). The power plant was a Maybach HL 120 TRM 12 cylinder engine rated at 265 HP. Armor thickness varied from 10mm to 30mm. Adolf Hitler had ordered that all Panzerkampfwagen III be armed with the 50L60 KwK 39 in 1940, but for some unknown (and suicidal?) reason, the head of his ordnance department (his name is lost to obscurity and odds are he wound up in a ditch) decided to keep using the medium velocity 50L42 KwK 38 as it had already passed its acceptance tests. This was a huge and potentially devastating error - who knows what the outcome in numerous critical battles would have been (both in North Africa and on the Eastern Front) if all Panzerkampfwagen III had been armed with the high velocity 50L60 KwK 39 from late 1941 onward? While not as lethal as the 75L43 KwK 40 or 75L48 KwK 40, it could deal effectively with the T-34 series of Soviet AFVs at short range (as opposed to point blank range for the 37L46.5 KwK 35/36, or point blank range for the 50L42 KwK 38 unless the gunner had the luxury of tungsten cored APCR rounds).

PzIIIH
Weight: 21.6
Hull Armor: 60/30/60
Turret Armor: 30/30/30
Main Gun: 50mm
Top Speed. 40
Crew: 5



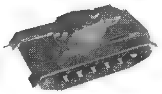
Between 1940 and 1941, 308 **Panzerkampfwagen III H** were produced. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner). Armament consisted of a 50L42 KwK 38 and two 7.92mm MG34 (one coaxial, one bow mounted). The power plant was a Maybach HL 120 TRM 12 cylinder engine rated at 265 HP. Armor thickness varied from 10mm to 60mm. This version was nearly identical to the Ausf G, with the exception of appliqué armor plates to improve protection, larger road wheels (which then became standard on all vehicles) and a newer and more advanced suspension (which also became standard on all vehicles). During 1942-1943, many surviving Ausf H were rearmed with the 50L60 KwK 39. In preparation for *Operation Seelowe* (the planned invasion of England) some Panzerkampfwagen III H were converted to be able to travel underwater (for use during amphibious operations). These vehicles were called *Tauchpanzer III*, and were used on the Eastern front by the 18th Panzer Regiment to cross the Bug river at Patulin on June 22, 1941.

PzIIIJ
Weight: 22.3
Hull Armor: 50/30/53
Turret Armor: 30/30/30
Main Gun: 50mm
Top Speed: 40
Crew: 5



There were 2616 **Panzerkampfwagen IIIJ** produced between 1940 and 1941. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner). Some of the earliest production vehicles carried the 50L42 KwK 38 as main armament, all later production vehicles carried the 50L60 KwK 39 as main armament (eventually all Ausf J were armed with the 50L60 KwK 39). All Ausf J were also armed with two 7.92mm MG34 (one coaxial and one bow mounted). The power plant was a Maybach HL 120 TRM 12 cylinder engine rated at 265 HP. Armor thickness varied from 10mm to 55mm, but appliqué plates were now replaced with thicker plates on the production line (which improved overall protection). Due to the better armor protection and greater tank killing ability of the Ausf J (as opposed to the Ausf H), it was called the 'Mark III Special' by the British who encountered it in North Africa.

PzIIIL
Weight: 23.6
Hull Armor: 50/30/53
Turret Armor: 57/30/30
Main Gun: 50mm
Top Speed: 40
Crew: 5



During 1942, 653 **Panzerkampfwagen IIIL** were produced. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner). Armament consisted of a 50L60 KwK 39 and two 7.92mm MG34 (one coaxial, one bow mounted). The power plant was a Maybach HL 120 TRM 12 cylinder engine rated at 265 HP. Armor thickness varied from 10mm to 51mm, increased again in an attempt to keep up with the gun/armor race. However, the end was in sight for the 50L60 KwK 39 as the end of 1942 approached - it simply could not defeat the T-34 series of Soviet AFVs at acceptable ranges. Fourteen Ausf L were still in service in Normandy in 1944, but were used only as command vehicles.

By the end of 1943, the Panzerkampfwagen III was almost entirely replaced by the Panzerkampfwagen IV as a main battle tank. The Panzerkampfwagen III's lack of ability to be armed with larger caliber and higher velocity main armaments was the main cause of its replacement by the Panzerkampfwagen IV. However, it was the basis for one of the most effective, numerically important and famous AFVs used by the Germans during the Second World War - armed with a 75L24 KwK 40 and later the 75L43 KwK 40 and 75L48 KwK 40 and converted into a turretless but well armored assault gun with a low profile (very useful in tank hunting/ambush situations) the Panzerkampfwagen III chassis soldiered on to the end of the Second World War as the Sturmgeschutz III.

Panzer IV and Variants

PzIVF2
Weight: 23.6
Hull Armor: 50/40/20
Turret Armor: 50/30/30
Main Gun: 75mm
Top Speed: 40
Crew: 5

Between 1938 and 1945, 8579 Panzerkampfwagen IV (versions A through J) were produced. If the Panzerkampfwagen III can be called the backbone of the Panzer divisions for the first half of the Second World War, the title must pass to the Panzerkampfwagen IV

Back on the advance: German infantry ride into action, 1944.

for the second (and far more desperate) half of the Second World War. In addition, the Panzerkampfwagen IV is regarded by many as one of the greatest AFVs of all time. The Panzerkampfwagen IV Ausf H that fought in the bocage of Normandy, and retreated across Russia during the long withdrawal from late 1943 onward had a better main armament (but still a 75mm gun), slightly better armor protection and other minor changes that distinguished them from their older brothers, the Panzerkampfwagen IV Ausf A, but they were all the same basic vehicle. While not the best AFV of the Second World War, it certainly ranks high as one of the best *designed* AFVs. Why? Because from 1935 through 1945, while numerous models of AFVs built by many different nations became obsolete and disappeared from the battlefield, the Panzerkampfwagen IV remained a competitive and dangerous opponent until the end of the war. The forethought present in its design allowed it to carry a more powerful main armament and more armor, whereas many other AFVs reached their maximum developmental potential and disappeared long before the end of the Second World War. A very good comparison is Messerschmitt's Bf 109 fighter. While not the best aircraft in the skies by 1944, in the hands of a skilled pilot it was dangerous and competitive even in 1945. The same can be said of the Panzerkampfwagen IV, which, when wielded by veteran German Panzer crews, more often than not held their own against more advanced enemy AFVs in the later days of the Second World War.

PzIVG
Weight: 23.6
Hull Armor: 80/30/20
Turret Armor: 50/30/30
Main Gun: 75mm
Top Speed: 40
Crew: 5

PANZER COMMANDER includes the D, F2, G, H and J models of the Panzer IV series.

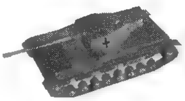
The **Panzerkampfwagen IV F2** was powered by the 300 HP Maybach HL 120 TRM 12 cylinder engine. Armament consisted of a 75L43 KwK 40 and two 7.92 MG34 (one coaxial and one bow mounted). It had redesigned armor, more effective than the appliqué plates of the Ausf E, with thickness between 14mm and 30mm. Although only Ausf F2 were produced (this total includes twenty-five Ausf F1 that were converted to Ausf F2), between March 1942 and May 1942, their impact was far out of proportion to the number that engaged in combat. The British, who first faced the Ausf F2 in North Africa, called it the 'Mark IV Special' as it proved to be superior to any of the

British or American AFVs facing it at that time. In one engagement taking place on the Eastern front, eleven Ausf F2 destroyed over sixty T-34 M41 in a two hour engagement. While the greater experience and skill of the German Panzer crews at this point in the war greatly influenced the outcome, the 75L43 KwK 40 was truly what made such a victory possible, allowing the German Panzer crews to engage their opponents at a much greater range than ever before. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner).

Between May 1942 and March 1943 1275 **Panzerkampfwagen IV G** were produced. They were nearly identical to the Ausf F2, being powered by the same engine and carrying the same armament (a 75L43 KwK 40 and 2 7.92mm MG34s - one MG34 being mounted coaxially and the other being mounted in the bow). Armor thickness was increased, now varying from 16mm to 35mm in thickness. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner).

PzIVH

Weight: 25.0
Hull Armor: 80/30/20
Turret Armor: 80/30/20
Main Gun: 75mm
Top Speed: 38
Crew: 5



From April 1943 onward, *schuerzen* (thin steel armored skirts, intended to defeat HEAT and small caliber high velocity AT rounds) began to appear on the Panzerkampfwagen IV. Also, from February 1943 onward, *ostketten* ('Eastern Tracks', wider tracks to assist with the softer and muddier ground on the Eastern front) began to appear on the Panzerkampfwagen IV as well. From 1943 until the end of the Second World War, whenever a Panzerkampfwagen IV was being repaired or undergoing heavy maintenance it was generally brought 'up to standard' for whatever the standard was at that time (addition of *schuerzen*, *ostketten*, appliqué armor plates, current camouflage schemes, etc.). This resulted in a great number of variations among vehicles within the same unit. From mid 1943 through late 1944, most Panzerkampfwagen IV were also coated with *zimmerit* (a paste designed to defeat magnetic and/or 'sticky' anti tank charges used in close assault, by breaking up the smooth surface of an AFVs armor and denying magnetic charges metal on metal contact). This was in response to a perceived threat of greater use of specialized close assault weapons by enemy tank hunting teams, but as the threat never materialized it was no longer a standard option by the end of 1944.

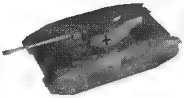
Between March and April of 1943, an additional 412 **Panzerkampfwagen IV G** were produced armed with the 75L48 KwK 40. In addition, they were up armored to Ausf H/Ausf J standards and when fitted with *schuerzen* were nearly identical to the Ausf H/Ausf J. They were powered by a 300 HP Maybach HL 120 TRM 12 cylinder engine and carried two 7.92mm MG34 in addition to their main armament (one coaxial and one bow mounted). Armor thickness was between 20mm and 50mm, the heaviest armor any Panzerkampfwagen IV would ever carry into battle during the Second World War. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner).

Panthers acting as artillery support, France, 1944.

From April 1943 through July 1944 3774 **Panzerkampfwagen IV H** were produced, making the Ausf H the classic late war Panzerkampfwagen IV. *schuerzen* were almost standard, and appliqué armor plates bringing the maximum thickness up to 50mm were standard for all Ausf H as well as all later Panzerkampfwagen IV. Armament consisted of a 75L48 KwK 40 and two 7.92mm MG42 (one coaxial and one bow mounted). In addition, a third MG42 was sometimes mounted on a pintle mount near the commander's hatch for use against enemy aircraft and soft targets. The standard power plant was a 300 HP Maybach HL 120 TRM 12 cylinder engine. Armor thickness was between 20mm and 50mm. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner).

From June 1944 through March 1945 there were 1758 **Panzerkampfwagen IV J** produced. One important difference between the Ausf J and the Ausf H (and all other Panzkampfwagen IV) was the absence of the electrical turret traverse motor in the Ausf J. It was removed to make room for greater fuel storage (a bad trade in the eyes of almost any AFV crew member). This final production version of the Panzerkampfwagen IV had 'all the bells and whistles'. *Schuerzen* were standard, as was a 7.92mm MG42 on a pintle mount for the commander (in addition to the 75L48 KwK 40 and two 7.92mm MG42 mounted coaxially and in the bow). Another interesting addition was the *nahverteidigungswaffe* (a 92mm grenade projector mounted on the commander's cupola, it was used for added close quarters defense and the firing of smoke grenades). Its armor thickness varied from 20mm to 50mm. Aside from the above mentioned differences, it was very similar to the Ausf H with the exception of a few minor changes in the exhaust and suspension systems - these changes were made to help simplify production. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner).

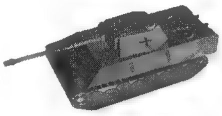
PzIVJ
Weight: 25.0
Hull Armor: 80/35/20
Turret Armor: 80/38/30
Main Gun: 75mm
Top Speed: 38
Crew: 5



In addition to their use in German armored formations, the Panzerkampfwagen IV was also used by the armies of Finland, Hungary, Bulgaria, Croatia and Rumania during the Second World War. After the Second World War, the Panzerkampfwagen IV soldiered on with the armies of Finland, Egypt, Spain, Jordan, Turkey and Syria. The last record of Panzerkampfwagen IV in combat was their use by the Syrian army during the 1967 Arab-Israeli war.

Panther

Panther D
Weight: 43.0
Hull Armor: 80/40/40
Turret Armor: 80/45/45
Main Gun: 75mm
Top Speed: 46
Crew: 5

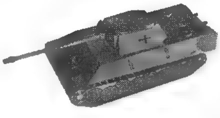


Once they had recovered from the shock, the German AFV engineers began to learn quite a few lessons from observing the excellent design of the Soviet built T-34 series of AFVs. There are many sources that state that the T-34 was the inspiration for the Panzerkampfwagen V, otherwise known as the 'Panther'. While the T-34 was probably not the *inspiration* for the Panzerkampfwagen V (German engineers in general tended to plan three or more years in advance when it came to AFVs - the concept of the Panzerkampfwagen VI was in existence as early as 1937 according to some sources), it can definitely be said that the design of the T-34 influenced what the final design of the Panzerkampfwagen V would be. In fact, one of the competing prototypes of the Panzerkampfwagen V was dropped from the competition because its appearance was too similar to that of the T-34; there were honest concerns of mistaken identity on the battlefield.

There were several key concepts included in the design of the Panzerkampfwagen V whose merits were recognized due to the effectiveness of the T-34:

- Well sloped armor, giving greater protection for less weight. The Panzerkampfwagen V was the first German designed and built AFV to incorporate heavily sloped armor.
- Wide tracks to reduce ground pressure and increase mobility on wet and/or soft ground. The Panzerkampfwagen V had close to the lowest ground pressure of any heavy tank that saw combat during the Second World War.
- Usage of a high performance engine for high mobility. Although the Panzerkampfwagen V was nearly twice the weight of the Panzerkampfwagen IV, its engine was more than twice as powerful. This (along with the wide tracks mentioned above and the most advanced suspension designed and deployed on any AFV during the Second World War) gave the Panzerkampfwagen V better cross country mobility and flat out speed than any other German medium or heavy AFV used during the Second World War.

Panther A
Weight: 45.5
Hull Armor: 80/40/40
Turret Armor: 110/45/45
Main Gun: 75mm
Top Speed: 46
Crew: 5



In addition to the above mentioned factors, the Panzerkampfwagen had a very high velocity and *extremely* hard hitting main armament (the 75L70 KwK 42). The result of all these concepts and innovations being incorporated in the design of one single vehicle resulted in what many experts agree was the best all around AFV to see combat during the Second World War. The Panzerkampfwagen V was fast, tough, hard hitting, and while larger overall than the T-34 it had a very low silhouette for its size. One on one with a veteran crew manning it, the Panzerkampfwagen V was more than a match for all comers. Fortunately for Germany's wartime enemies, the odds in tank versus tank combat were rarely (if ever) one on one.

Two telling statistics regarding Panzerkampfwagen V effectiveness versus enemy AFVs:

1. Over 70% of all Panzerkampfwagen V lost to enemy action were victims of enemy artillery fire or enemy air attack.
2. The U.S. Army, after numerous combat evaluations, determined that on average it took five M4 medium tanks ('Shermans') to destroy one Panzerkampfwagen V ('Panther').

Panther G

Weight: 44.8

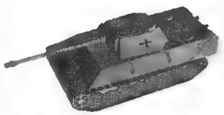
Hull Armor: 80/50/40

Turret Armor: 100/45/45

Main Gun: 75mm

Top Speed: 46

Crew: 5



When you consider that German AFVs were outnumbered at least five to one or more by the time the Panzerkampfwagen V was in large scale front line service, the above statistics seem even more impressive. But despite the excellent design of the Panzerkampfwagen V and the usually high levels of experience and skill of the crews that fought in them (not to mention the usually superior tactics used by Germany's Panzer forces at the platoon and higher levels), they could not defeat the numerical superiority which they were forced to face. This disadvantage, combined with opponents who were themselves becoming more skilled and more experienced as the war dragged on, was too much for even the best Panzer units of the Germany military to handle.

PANZER COMMANDER presents all three known production variants of the Panther: D, A and G.

Between January of 1943 and September 1943, 850 total **Panzerkampfwagen VD** were produced. They were armed with the excellent 75L70 KwK 42 and a 7.92mm MG34 (mounted coaxially). The first 250 produced carried the Maybach HL 210 P 30 12 cylinder engine rated at 595 HP. Due to insufficient testing time, an under-powered engine (as opposed to the engine it was intended to carry), and a combat weight that exceeded design specifications by eight tons, these first 250 Ausf D were plagued by engine and transmission problems during their combat debut in *Operation Zitadelle*. Of the original 250, only 43 remained in service by August of 1943. The last 600 Ausf D produced (also called Ausf D2) were powered by the much improved Maybach HL 230 P30 12 cylinder engine, this power plant rated at 715 HP. This engine became the standard power plant for all subsequent versions of the Panzerkampfwagen V. Armor thickness ranged from 16mm to 110mm, and most armor facings were extremely well sloped. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner).

Between August of 1943 and May of 1944, 2000 **Panzerkampfwagen VA** were produced. Armament consisted of a 75L70 KwK 42 and two to three 7.92mm MG 34 (one coaxial, one bow mounted, and occasionally one mounted on the commander's cupola). It was powered by a Maybach HL 230 P30 12 cylinder engine rated at 715 HP. Armor thickness ranged from 16mm to 110mm, and most armor facings were extremely well sloped. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner). The main differences between the Ausf A and the earlier Ausf D were a redesigned turret and mantlet (to provide better sloping/protection and eliminate a shell trap on the mantlet), a ball mount for the bow MG position (as opposed to an unwieldy spring mount which the ad hoc bow MGs most often mounted on Ausf D usually used), slight redesign/changes in the exhaust and transmission (to eliminate the teething troubles the Ausf D suffered from), a lower profile commander's cupola, and light armor skirts to protect the upper track and running wheels (similar to, but not actually *schuerzen*). With the teething troubles of the Ausf D fixed, the Ausf A was a truly formidable AFV.

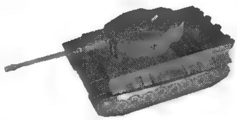
Between March of 1944 and April of 1945, 3126 **Panzerkampfwagen V G** were produced. Armament consisted of a 75L70 KwK 42 and two 7.92mm MG 34s (one coaxial, one bow mounted) and a 7.92mm MG42 (mounted on the commander's cupola). It was powered by a Maybach HL 230 P30 12 cylinder engine rated at 715 HP. Armor thickness ranged from 16mm to 110mm, and most armor facings were extremely well sloped. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner). The main differences between the Ausf G and the earlier Ausf A were the removal of the driver's vision slit and its replacement with a rotating periscope and the addition of a *nahverteidigungswaffe* (a 92mm grenade projector mounted on the commander's cupola).

One interesting side note - the next planned version of the Panzerkampfwagen V was the Ausf F. It was intended to be equipped with a FG 1250 infrared sight and a telescopic range finder. For night combat operations, they ideally would have operated in platoons of five vehicles alongside a SPW 251/20 *Uhu* ('Owl') equipped with a 60cm infrared searchlight. Fifty Ausf G actually used the FG 1250 infrared sight in combat on the Eastern front during the final months of the war, although it is unknown if they conducted any operations with supporting SPW 251/20s.

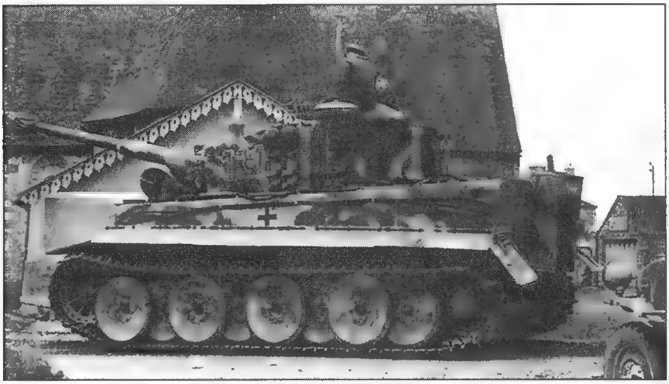
Much like the Panzerkampfwagen III and Panzerkampfwagen IV, the Panzerkampfwagen V chassis was also used for numerous variants and variant prototypes. The most famous of these (and the most effective tank destroyer to see action during the Second World War) was the Jadgpanzer V (also known as the 'Jagdpanther'), which had better armor thickness and protection than the Panzerkampfwagen V, and mounted the even deadlier 88L71 KwK 43.

Tiger I

Tiger I
Weight: 55.0
Hull Armor: 100/80/82
Turret Armor: 100/80/80
Main Gun: 88mm
Top Speed: 38
Crew: 5



The Panzerkampfwagen VIE, otherwise known as the 'Tiger I' was the first German purpose designed and built heavy tank. It was designed to carry the 88L56 KwK 36 (a cousin of the famous German '88', dual purpose anti aircraft/anti tank gun), by far the most powerful tank mounted gun at the time of its conception. In addition, it was designed with thicker armor plates (though not well sloped) than any other AFV in the world. With this massive firepower and excellent armor protection, a very low silhouette for its size, and sinister shape, it soon was the nightmare of choice for Allied tank crewmen around the world. It did have several faults however. The early production vehicles were under-powered for their weight, which gave them poor cross-country performance. All versions of the Tiger I had poor range due to the massive weight of the vehicle. And earlier vehicles suffered from teething troubles with the transmission, which led to break downs more frequent in occurrence than with the



Defending the Fatherland: A Tiger on alert in Germany, 1945.

Panzerkampfwagen III or Panzerkampfwagen IV. Despite these problems, the Panzerkampfwagen VI Ausf E had a huge impact on the course of the battles it was involved in. In the later years of the Second World War, with Germany's Panzer units fighting more and more defensive battles (as opposed to the massive battles of breakthrough and maneuver that took place in the earlier years of the Second World War) the Panzerkampfwagen VI Ausf E was increasingly more and more 'in its element'. Tiger I tanks were organized into special *schwere Panzerabteilung* (heavy tank battalion) and attached at the Corps or Army level. The crews of the *schwere Panzerabteilung* were hand picked, and nearly always experienced combat veterans. These factors, combined with the fact that Panzerkampfwagen VI Ausf E were nearly always in the center of the most desperate battles, gave the Panzerkampfwagen VI Ausf E a fame (or notoriety) totally out of proportion with the relatively small number of them produced. The Panzerkampfwagen VI Ausf E first saw combat on August 29, 1942 in a forested swamp near Leningrad. Not even a powerful vehicle like the Tiger I could overcome such a poor choice of location for the employment of a heavy main battle tank. The Soviet AT gun crewmen quickly realized they could not penetrate the frontal armor of the massive Tigers, so they promptly immobilized them by shooting their tracks and wheels. Immobilized, the Tiger crews abandoned their vehicles and set fire to them, to prevent the Soviets from capturing or studying them. Despite such an inauspicious start, they quickly developed a reputation as a dangerous and tough opponent from the time of their next employment (near Tunisia in December of 1942) until the end of the Second World War.

From mid 1943 through late 1944, most Panzerkampfwagen VI Ausf E were also coated with *zimmerit* in response to a perceived threat of greater use of specialized close assault weapons by enemy tank hunting teams, but as the threat never materialized it was no longer a standard option by the end of 1944.

Between July of 1943 and August of 1944, 1354 Panzerkampfwagen VI Ausf E were produced by Germany. It had a crew complement of five men (commander, driver, gunner, loader and bow machine gunner). The earlier vehicles were armed with an 88L56 KwK 36, two 7.92mm MG34 (one coaxial, one bow mounted), and several command detonated AP mines attached to the hull and turret for added close defense versus enemy infantry. The power plant was a Maybach HL 210 P 45 12 cylinder engine rated

Field maintenance: Crews repaint a Tiger II, 1944.

at 600 HP, and as a result the earlier Panzerkampfwagen VI Ausf E were underpowered and their off road performance suffered. Early Panzerkampfwagen VI Ausf E also had several transmission problems, which affected battlefield readiness. Armor thickness varied from 25mm to 100mm, but there was little sloping on most armored facings. However, armor protection was still excellent due to the sheer thickness and advanced welding techniques incorporated with the armor plate. The later production vehicles had several design and armament improvements. The engine was now a more powerful Maybach HL 230 P 45 12 cylinder rated at 700 HP. A 7.92mm MG42 was added to the commander's cupola, as was a *nahverteidigungswaffe*. The command detonated AP mines were dropped from usage, probably to the relief of Panzergrenadiers everywhere. The transmission problems were mostly fixed, and many of the parts on the later Panzerkampfwagen VI Ausf E were interchangeable with later versions of the Panzerkampfwagen V to simplify production, maintenance, and repair. A clever device used by the Tiger I (as well as some Panzerkampfwagen IV, and most Panzerkampfwagen V D) was a rotating ring, with markings like a clock (i.e. from 1 to 12 with finer subdivisions as well) that ran the circumference of the inside of the commander's cupola. The ring rotated in the opposite direction (but at the same speed) of the turret. This allowed the AFV commander to instantly tell the turret's position relative to the hull's axis - something easily forgotten under the stresses of AFV combat. It was also an aid for bringing the gun on-line with a target quickly. The gunner had a clock scale as well - when the commander gave the gunner a bearing ("gunner! T-34! 2 o'clock!") the gunner simply aligned his scale with the bearing given by the commander and the target appeared in his gunsight.

Some 90 Panzerkampfwagen VI Ausf E chassis not accepted for production were converted into Panzer Jaeger VIs (otherwise known as Panzer Jaeger Tigers, Ferdinands, or 'Elefants'). This was a Panzerkampfwagen VI E chassis with a heavily armored box in lieu of a turret, armed with an 88L71 KwK 42/2.

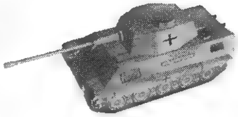
Tiger II

The Panzerkampfwagen VI B , otherwise known as the Tiger II is regarded by many historians as the most powerful AFV to see combat during the Second World War. While the name suggests it was a later model of the Panzerkampfwagen VI E, it was actually almost an entirely new design, and resembled a larger Panzer-kampfwagen V more than the Panzerkampfwagen VI Ausf E. Even heavier than the Ausf E, the Ausf B had even worse off road mobility and a shorter range, making it an almost purely defensive weapon. However, this was the posture of most German AFVs during the last two years World War II anyway. The armor was incredibly thick and fairly well sloped, making it almost impervious to enemy shell hits against the frontal armor. The largest enemy cannon in existence could penetrate the frontal armor at close range – if they managed to get there and survive long enough to get off an accurate shot. Most were unsuccessful. Over 80% of all Tiger II lost in combat were the victims of enemy artillery fire or air attack – and most of these were mobility kills. In other words, the vehicle was usually immobilized without loss to the crew, but the Panzerkampfwagen VI B was nearly impossible to tow or recover due to its great weight; such damaged vehicles were usually destroyed by their own crews and/or abandoned. If one quote could sum up the power of a functioning Tiger II in combat, it would probably be this one:

"I opened fire and destroyed the first and last of the Stalin tanks...My own personal score of enemy tanks destroyed in this action was 39."- **Karl Korner, sSSPzAbt, April 1945.**

Between December of 1943 and March of 1945, 489 **Panzerkampfwagen VI Ausf B** were produced by Germany. The Tiger II had a crew complement of five men (commander, driver, gunner, loader and bow machine gunner). It was powered by a Maybach HL 230 P 30 12 cylinder engine rated at 700 HP. It was armed with an 88L71 KwK 43 - perhaps the best all around lethal main armament carried by an AFV in combat during the Second World War. *There is one account of a Panzerkampfwagen VI Ausf B destroying a T-34 at a range of 4.5km!* In addition to its main armament, the Ausf B was equipped with three 7.92mm MG42 (one coaxial, one bow mounted, and one on the commander's cupola) and a *nahverteidigungswaffe*. Armor thickness varied, ranging from 40mm to 185mm! This massive thickness, combined with good sloping, made the *Konigstiger* nearly invulnerable to direct fire attacks through its frontal facing. For most of 1944, the majority of Tiger II were also coated with *zimmerit*, but it was no longer a standard option by the end of 1944.

Tiger II
Weight: 69.7
Hull Armor: 100/80/80
Turret Armor: 185/80/80
Main Gun: 88mm
Top Speed: 38
Crew: 5



As with most other German AFVs, some Panzerkampfwagen VI Ausf B chassis were converted for use as tank destroyers. In this case, the result was the gargantuan Jagdpanzer VI Ausf B (also know as the 'Jadgtiger', or 'Hunting Tiger'). The main armament consisted of a 128L55 KwK 44 (the most powerful vehicular mounted gun of the Second World War - there are several accounts of it penetrating the frontal armor of a U.S. M26 'Pershing' at a range of 2100m) and well sloped armor plate with a thickness varying between 40mm and 250mm.

Show Trials: A pre-war Soviet tank performs for the staff, 1939.

Soviet Vehicles

Ironically, though the Soviets began the war with an advantage in terms of the number and quality of armored combat vehicles, Stalin's purges left the Red Army bereft of experienced leadership. In addition, trained tank operators and maintenance technicians were difficult to come by, with the result that, when the German invasion began, much of the Soviet tank corps were in a state of disrepair and many of the tank crews had had only a few hours of training with their vehicles. Further, half of the Soviet tank strength was assigned as support vehicles for infantry divisions, a role that left them unable to concentrate in sufficient force to repel the German Panzer divisions.

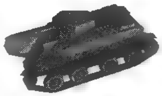
Still, the Red Army managed to give the Germans some nasty surprises – not the least of which were the T-34 and KV-1, tanks which were much better armed and armored than the biggest contemporary German tanks. These had been distributed to forward units in great secrecy and, though deployed only in limited numbers in 1941, these vehicles made a big impression on the German Panzer Corps and would heavily influence subsequent tank designs in Germany and in other parts of the world.

In addition, the Soviets learned some hard lessons from the Germans regarding the use of tanks and began forming more dedicated armored divisions which allowed them to employ these vehicles more effectively against German armor.

BT-5 and BT-7

Although the Soviets experimented with numerous tank designs before the war, the BT-5 and BT-7 "fast" tanks were the best of the pre-war tanks employed by the Red Army. High mobility and high reliability coupled with a 45mm anti-tank gun made these vehicles highly favored by the Soviet tank troops. The BT series of tanks featured a unique suspension system copied partly from the contemporary designs of the American J. Walter Christie. These were characterized by relatively

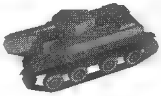
BT-5
Weight: 11.5
Hull Armor: 13/13/6
Turret Armor: 13/13/6
Main Gun: 45mm
Top Speed: 72
Crew: 3



large road wheels (the wheels which actually contact the ground through the treads) which could operate either with or without the treads, although in actual practice the treads were seldom removed due to the time required to perform this operation. The BT series tanks distinguished themselves in combat with the Japanese and in the Soviet invasion of eastern Poland.

Near the end of 1932 designs were drawn up for the BT-5. It had more a more powerful armament than its predecessors, a coaxial machine gun, radio equipment, and a roomier interior. A stronger engine would provide greater speed and mobility. It remained in service until 1941 when its armor and guns became obsolete against the powerful German tanks.

BT-7
Weight: 14.0
Hull Armor: 13/13/6
Turret Armor: 13/13/13
Main Gun: 45mm
Top Speed: 86
Crew: 3



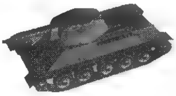
Though outwardly very similar in appearance to the BT-5, the BT-7 featured several improvements, including a better engine, heavier armor and fully-welded construction, as opposed to the riveted construction employed in previous tanks in the series. Both the **BT-5** and the **BT-7** are available in PANZER COMMANDER.

Production of **BT-5** tanks began in 1932. It was armed with a 45mm gun and one 7.62mm DT machine gun, (coaxially mounted). It was powered by a 12 cylinder M-5 aircraft engine. Armor was moderately sloped, with thickness varying between 5mm and 15mm. The crew consisted of three men (commander-loader, driver and gunner). The **BT-7** was very similar, but it had the new M-17T engine, rated at 450HP, and thicker turret armor .

T-34 Series

Not only was the T-34 numerous, but in 1940 (when it was first delivered to Soviet tank units) it was also the best tank design in the world. If the Panzerkampfwagen V is arguably the best overall medium tank of the Second World War, the T-34 should probably share the honors. Many of the basic features of the 'Panther' (produced from 1943 through 1945) were inspired by T-34 actually deployed by 1940. Some of the strengths of the T-34 were:

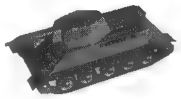
T34/41
Weight: 26.5
Hull Armor: 45/45/47
Turret Armor: 52/52/45
Main Gun: 76.2mm
Top Speed: 46
Crew: 4



- Incredible power to weight ratio for its time. It carried a 500 HP engine when most other AFVs were carrying 100-200 HP engines.
- Awesome mobility over nearly any type of terrain. This was a result of wide tracks, a well designed suspension, and a powerful engine; most other AFVs of the same period had much narrower tracks. During the bitter Winter battles of 1941 on the Eastern front, when the T-34 gave the Germans a hard and merciless wake up call, the German infantry had their own name for the T-34, 'The Snow King' given to it for its ability to operate in almost any extreme of climate, weather or ground conditions.

- Great armor protection and armor design. The T-34 had sloping armor long before any other AFV designs had begun to incorporate it, which also allowed it to save some weight; sloped armor produces a lower silhouette and protects as well as thicker armor without a slope.
- Good armament. At the time of its delivery, most other AFVs had a main armament that was between 37mm and 50mm in size; the T-34 was armed with a good medium velocity 76mm gun.

T34/42
Weight: 28.5
Hull Armor: 47/47/47
Turret Armor: 65/65/47
Main Gun: 76.2mm
Top Speed: 55
Crew: 4

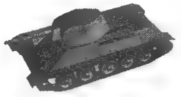


The early T-34s did have some problems. The crew compartment was cramped. Communications equipment was inferior to that of German AFVs (the Germans often defeated Soviet armored units early in the war despite horrendous odds – superior communications and tactics made this possible). The transmission of the earlier models was prone to break down (but then again, all early model AFVs suffered this problem). Finally, a two-man turret (as opposed to the three-man turrets of most German AFVs) lowered the effective rate of fire of the main armament, and reduced combat efficiency in general.

Despite these problems, the early T-34 was nearly too much for the German military to handle. In the first year of combat on the Soviet front, the biggest threats to a T-34 (in order of severity) were:

1. Air attack. (German infantrymen on the Eastern front affectionately called Ju 87 pilots 'Infantrymen with wings.')
2. Direct fire from an 8.8cm FlaK 18/36 or other really large gun at medium or close range. (Recall that these types of weapons were not mobile at this point in the war.)
3. Heavy artillery fire (An immobilized T-34 was much less of a threat.)
4. A very close range hit from a first line tank or AT gun to the side or rear armor.
5. Close assault by German infantry (The reason that German infantry were the best tank killers of World War II was that they had to learn to kill T-34 without AT guns.)

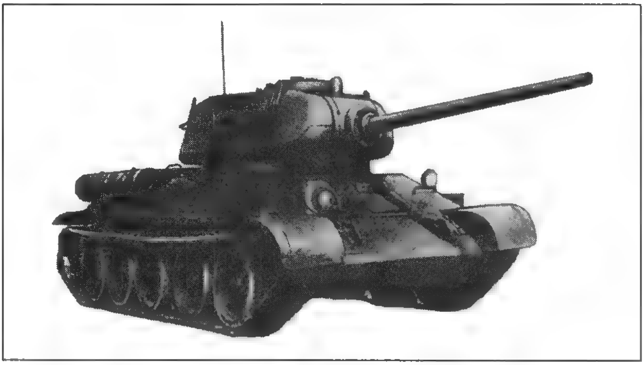
T34/43
Weight: 30.9
Hull Armor: 47/60/47
Turret Armor: 70/52/53
Main Gun: 76.2mm
Top Speed: 55
Crew: 4



In other words, the T-34 was a dangerous opponent that was very difficult to kill. Add to this the fact that they outnumbered their foes on most occasions and you can understand why the Germans placed such a premium on tactical skill and initiative - it was their only hope.

As the war progressed, the T-34 became much improved and many (if not all) of its original faults disappeared. This, combined with Soviet AFV crews who were now becoming more experienced (and thus more skilled) and better Soviet armored tactics in general (although not ever really the equal of the Germans) made the T-34 an increasingly dangerous foe.

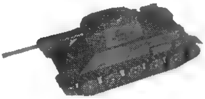
Between 1939 and 1945, Russia produced roughly 64500 T-34 of one model or another. PANZER COMMANDER provides four models of the T-34 series, the T-34/41, T-34/42, T-34/43 and the T-34/85.



Bigger and better: The T-34/85 replaced the T-34/43 in late 1943.

T-34, Model 41 the original model, had a production run of roughly 1000. Of these, 967 were with the western military districts on June 22, 1941. It was armed with a 76L35 cannon and two 7.62mm DT MG (one bow mounted, one coaxial). It was powered by a 12 cylinder V-2 diesel engine rated at 500 HP. Armor was well sloped, with thickness varying between 20mm and 55mm. The crew consisted of four men (com-

T34/85
Weight: 32.0
Hull Armor: 47/60/47
Turret Armor. 90/75/60
Main Gun: 85mm
Top Speed: 55
Crew: 5



During 1941, 2996 **T-34/42** were built, despite numerous factory relocations due to rapid German advances. Originally intended as a platoon commander's vehicle, but rushed into general use due to the high demand for its improved main armament. It was armed with a 76L41 cannon and two 7.62mm DT MGs (one bow mounted, one coaxial). It was powered by a 12 cylinder V-2 diesel engine rated at 500 HP. Armor was well sloped, with thickness varying between 45mm and 70mm. The crew consisted of four men (commander, driver, gunner and loader).

Roughly 9000 **T-34/43** were built during 1942 (they needed them, over 6000 were lost in three battles during the summer of 1942!). This model was nearly identical to the T-34/42, the only difference being minor improvements in the transmission. It was armed with a 76L41 cannon and two 7.62mm DT MGs (one bow mounted, one coaxial). It was powered by a 12 cylinder V-2 diesel engine rated at 500 HP. Armor was well sloped, with thickness varying between 45mm and 75mm. The crew consisted of four men (commander, driver, gunner and loader).

Between 1944 and 1945, 29500 **T-34/85** were built. Much like their American and British counterparts, the Soviets found their AFVs to be somewhat under-gunned by mid 1943 (this coincides with the appearance of the newer and more powerful German AFVs). Their solution was to mount a more powerful gun in the proven T-34 design. The Soviets had been learning some lessons from the Germans as well over the past two to three years, and mounted the new main armament in a new three man turret. Crew size was also increased, and a smoke discharger system (although still inferior to German smoke dischargers) was added as well. It was armed with an 85L53 M1944

In our names: Soviet workers present new tanks to their crews, 1943.

ZiS53/D-5T cannon and two 7.62mm DT MGs (one bow mounted, one coaxial). It was powered by a 12 cylinder V-2-34 diesel engine rated at 520 HP. Armor was well sloped, with thickness varying between 45mm and 90mm. The crew consisted of five men (commander, driver, gunner, loader and bow machine gunner). In fact, so successful was the T-34/85 design that it would continue in production until 1964!

As with the Germans, the Soviets also converted some T-34 chassis for use as tank destroyers. The two most notable were the SU-85 (mounting the same main armament as the T-34/85, but with no turret and thicker armor) and the SU-100 (mounting an adapted 100mm naval gun with roughly the same AT performance as the German 88L71, and again with no turret and thicker armor).

KV-1 and Variants

KV-1/41

Weight: 43.5

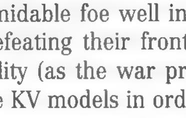
Hull Armor: 75/60/75

Turret Armor: 75/75/75

Main Gun: 76.2mm

Top Speed: 35

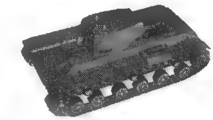
Crew: 5



The KV were heavy tanks. Nearly all models of the KV series had extremely thick armor, and they proved a serious headache to the Germans when first encountered. Aside from a track hit, or a shell from a very heavy cannon (8.8cm or larger), they were nearly invulnerable. While not nearly as mobile as the T-34, they all carried a 76mm or larger gun, and proved to be a formidable foe well into 1943 (even high velocity 75mm cannon had a difficult time defeating their frontal armor). The main drawbacks of the KV series were poor mobility (as the war progressed, more and more appliqué armor was added to successive KV models in order to stay ahead in the gun/armor race - this caused most subsequent versions of the KV to have progressively less mobility and even worse cross country performance) and it suffered from a poor interior layout (even though it had a three man turret, the layout was far from optimal - the commander could not be in his cupola while the main armament was being fired). While the layout problems were eventually addressed, the lack of mobility was a permanent problem. By late 1943, the IS (*Iosef Stalin*) series of heavy tanks had begun to replace the KV series, with the T-34 now being the only Soviet medium tank. In addition to reduced mobility and a poor layout, the KV series also had the largest silhouette of any front line Soviet AFV by 1942.

One interesting and humorous side note - the KV series had transmission gears that were notoriously difficult to shift. To remedy this, KV drivers were actually issued a small sledge hammer, called a 'shifting tool', to help 'persuade' the gearshift when it was not functioning smoothly; which was all the time.

KV-1/42
Weight: 47.0
Hull Armor: 110/120/90
Turret Armor: 120/120/90
Main Gun: 76.2mm
Top Speed: 28
Crew: 5



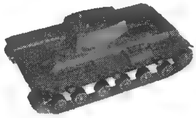
In a way, the KV series was a victim of 'natural selection' among AFVs. It's massive armor and good main armament made it a viable AFV from 1941 through 1945, but when better armed, better armored, and more mobile heavy tanks became available it was no longer given priority in terms of production. The Germans, notorious for producing far too many variants, could have benefited from learning this lesson. In addition to having to compete with the newer IS series, the KV series became slowly outdated as the Soviets shifted from the defense to the attack on a strategic level. Being very tiring to drive and not exceptionally fast or mobile, it was left behind in the AFV technological race.

Despite all this, it served well and was a very important part of the Soviet Union's armored forces from 1939-1943. During that time, and in those circumstances (desperate defensive fighting versus a tactically superior foe) it proved invaluable. Its greatest fault in the end was its inability to change enough to stay competitive in terms of firepower, protection, and mobility. This does not make it a poor tank design – many other tanks built by many other nations suffered the same fate.

Between 1939 and 1943, the Soviet Union produced roughly 6160 KV tanks. Four models of the KV series are represented in Panzer Commander, the KV-1/41, KV-1/42, KV-1S and the KV-85.

Roughly 830 **KV-1/41** were built between 1939 and 1941. 508 were in service on June 22, 1941. The KV-1/41 saw its first major combat versus the Germans, but some 1/41 prototypes saw action near Summa, Finland as early as December of 1940. Armament consisted of a 76L35 cannon and three to four 7.62mm DT MG (one bow mounted, one coaxial, one in the rear turret, and occasionally one on the commander's cupola). It had a crew of five men (commander, driver, gunner, loader and bow machine gunner). It was powered by a V-2-K 12 cylinder diesel engine rated at 600 HP. It was known for having transmission and engine problems far more frequently than the T-34 series. Armor thickness varied from 40mm to 75mm, with almost no sloping. However, unlike most tanks, thickness was nearly as great on the rear and side facing as it was on the front facings. Even the top armor plates were close to 35mm thick.

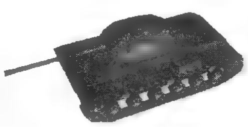
KV-1S
Weight: 42.5
Hull Armor: 75/60/60
Turret Armor: 82/82/82
Main Gun: 76.2mm
Top Speed: 45
Crew: 5



Between mid 1941 and mid 1942, approximately 2000 **KV-1/42** were produced. Armament consisted of a 76L41 cannon and three to four 7.62mm DT MG (one bow mounted, one coaxial, one in the rear turret, and occasionally one on the commander's cupola). It had a crew of five men (commander, driver, gunner, loader and bow machine gunner). It was powered by a V-2-K 12 cylinder diesel engine rated at 600 HP.

Mobility was further reduced from the effect of added appliqué armor plates. Armor thickness varied from 40mm to 120mm, with almost no sloping. Side and rear armor plates were nearly as thick as front plates. Top armor plates had a thickness of 42mm in most areas.

KV-85
Weight: 46.0
Hull Armor: 75/60/60
Turret Armor: 160/110/100
Main Gun: 85mm
Top Speed: 40
Crew: 4



A total of 1232 **KV-1S** were produced between 1942 and 1943. The 's' stood for *skorostnoy*, which is Russian for 'fast'. This model was an attempt to produce a heavy tank with greatly improved mobility. The only problem was that to achieve this, the armor thickness was drastically reduced. This, combined with the lack of any sloping, gave the KV-1S far less protection than a T-34 without the same degree of mobility. The only real advance in the design of the KV-1S was a newly redesigned three man turret - one in which the commander could now be in his cupola while the main gun was in action. Armament consisted of a 76L41 cannon and three 7.62mm DT MG (one bow mounted, one coaxial, one in rear turret). It had a crew of five men (commander, driver, gunner, loader and bow machine gunner). It was powered by a V-2-K 12 cylinder diesel engine rated at 600 HP. Armor thickness varied from 30mm to 85mm, with almost no sloping.

Only 130 **KV-85** were produced from mid 1943 to late 1943. In attempt to counter the appearance of the 'Tiger' and 'Panther', the chassis of the KV-1S was mated with the prototypical turret of the IS-1. The IS-1 turret had a much improved layout even when compared to the 'new' turret of the KV-1S. As a result, crew size was reduced to four men (commander, driver, gunner and loader) without a large drop in combat efficiency. Armament consisted of an 85L53 M1944 ZiS53/D-5T cannon and three 7.62mm DT MG (one bow mounted, one coaxial, one in the rear turret). It was powered by a V-2-K 12 cylinder diesel engine rated at 600 HP. Armor thickness varied from 30mm to 160mm, with almost no sloping on hull facings but fair sloping on the turret facings and mantlet. There were none remaining in service by January 1944 - notsurprising considering a production run of only 130 vehicles and the rate at which the Soviets used up tanks.

Only the KV-1S chassis was converted for use as an assault gun (and the only example of this being the SU-152). However, the IS series was based on a redesigned KV hull and chassis - so the KV series never did totally 'fade away'.

IS-2

The IS-2 was the most numerous (and arguably the best) Soviet late war heavy tank to see action. It was the predecessor of the IS-3, a tank which was the benchmark for nearly every heavy tank designed between 1945 and 1960. The IS stood for *Iosef Stalin*, the entire series being named in honor of Russia's current leader/dictator. It was basically a redesigned KV hull and chassis (with improved armor design/sloping, and a much improved suspension and transmission) with a new three man turret. The intended main armament was originally an 85mm cannon (for the IS-1, the same weapon used in the T-34/85 and KV-85), then a 100mm cannon (the same used by the SU-100), but by the time the IS-2 was ready for production a 122L43 M1943 D-25 cannon was chosen as the main armament of the IS-2. The 100mm gun had slightly better anti-tank performance, but the 122L43 M1943 D-25 had far superior anti-personnel performance and was also easier to mass produce. Overall, the 88L71 KwK 43 was a better weapon, but no one would enjoy being engaged by a company (five vehicles) of IS-2s and their five 122mm tubes. The first time IS-2s were actually used in combat was at *Korsun Sjevkenskovskij* (the 'Korsun Pocket') in February of 1944.

The IS-2 was known for good mobility and cross country performance (excellent for an AFV of its size), very thick and very well designed/sloped armor, and a very powerful main armament, all wrapped up into a surprisingly small overall silhouette for a heavy tank of its size and power. In short, it was another armored nightmare for the German armed forces fighting in Russia.

The IS-2, although a fierce opponent, did have three notable drawbacks. The first was the slow rate of fire of the main armament. The second was the relatively low number of main armament rounds stowed within the tank itself. Its last Achilles' heel was its mantlet, which was vulnerable to high velocity AP rounds. German AT and AFV gunners were instructed to fire at the mantlet of all IS-1 and IS-2 with AP40 (extra high velocity armor piercing rounds with a core of tungsten or some other dense metal/alloy). There are numerous records of kills versus IS-1 and IS-2 (as well as IS-2M) by gunners using AP40 (nicknamed 'Arrowhead' by many gunners) fired from 7.5cm PaK 40 and 7.5cm KwK 40.

By mid 1944, several improvements were being routinely incorporated into the IS-2 design. The result was a variant often called the IS-2M. The IS-2M was almost identical to the IS-2, with the following exceptions: the hull armor was given an even greater slope, which dramatically improved its effectiveness and a heavy machine gun was added to the commander's cupola.

IS-2

Weight: 46.0

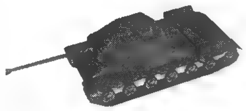
Hull Armor: 120/95/60

Turret Armor: 160/110/100

Main Gun: 122mm

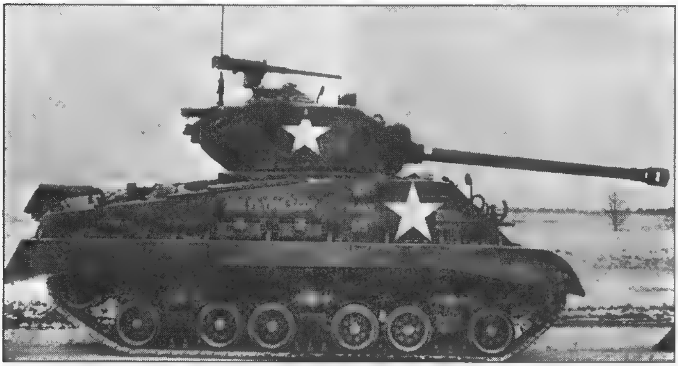
Top Speed: 37

Crew: 4



This was the final version of the IS-2, which was then followed by the even more advanced IS-3. However, there are no documented accounts of IS-3 actually seeing combat during the Second World War. The IS-2M is the variant represented in Panzer Commander.

Between mid 1944 and 1945, Russia produced approximately 1500 **IS-2M**. The IS-2M carried a crew of four men (commander, driver, gunner and loader). It was armed with a 122L43 M1943 D-25 cannon and three 7.62mm DT MGs (one in a fixed bow mount - fired remotely, one coaxial, and one in the rear turret) and a 12.7mm M1938 DShK MG (mounted to the commander's cupola) . It was powered by a V-2 IS 12 cylinder diesel engine rated at 520 HP. Armor thickness varied from 19mm to 132mm, and was very well sloped.



Easy Eight: The M4A3E8 was probably the best overall model of the M4 ever produced.

American Vehicles

Although the United States didn't enter the war officially until 1941, American tanks often appeared in Europe, Russia and North Africa as part of the Lend-Lease program. The British, in particular, were happy to acquire American vehicles as they were generally better armed and armored than the British tanks of the time.

Initially, U.S. tank development was hampered by the then-current policy, which placed the responsibility for operating tanks and developing new tank models firmly in control of the infantry. However, developments in Europe and the success of the German Panzer divisions forced the creation of a separate American Armored force and the development of larger and better-armed vehicles, including the famous Sherman tank, which would be the most widely-used tank in the American and British armed forces.

Although the Sherman was a capable vehicle, American combat doctrine called for the use of special-purpose vehicles designed specifically for countering the threat of enemy tanks. This led to the development of some of the most interesting U.S. army vehicles, the M10, M36 and M18 tank destroyers. Unlike similar vehicles developed by other nations, American tank destroyers were essentially tanks in all but name. Typically they mounted full turrets with armament comparable to or better than the American tanks of the day.

Finally, the British produced a number of variants of American vehicles equipped with British weaponry, most notably the very capable 17-pound gun. These will be highlighted in the section on British vehicles.

M4 Sherman and Variants

The M4 was one of the most widely produced tanks of the war and saw the development of numerous variants. The M4 chassis was derived from that of the M3 Grant, an interim design which was distributed to British and Soviet forces early in the war. The Sherman was a significant improvement over the Grant since it mounted a 75 mm cannon in the turret, whereas the Grant had its 75 mm gun mounted in the hull, limiting its traverse. Several U.S. companies produced the Sherman with a variety of power plants. The type most favored by the U.S. Army was the M4A3, which had a 500HP Ford V-8 gasoline engine.

The Sherman (named after a U.S. General from the American Civil War) was a very significant part of the "Arsenal of Democracy." While it did not excel in any one category, it was competitive, adaptable, effective, and reliable. It was designed to exploit breakthroughs. At the time of its development, U.S. Army doctrine defined its role as suppressing enemy infantry during the course of a breakout, and exploiting said breakout when it was achieved. Tank destroyers and anti-tank guns were supposed to neutralize enemy AFVs.

M4A3

Weight: 31.1

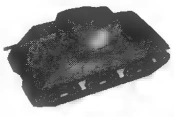
Hull Armor: 50/38/38

Turret Armor: 75/50/50

Main Gun: 75mm

Top Speed: 41.8

Crew: 5



While the M4 was a sound design, it did have its drawbacks. It had a high silhouette for its size, and compared to the German tanks of the day, the Shermans were under armed and armored. It was not uncommon to see Sherman tanks with improvised armor, including additional welded plates, sandbags or concrete! It was widely held at the time that it took six Shermans to kill one Tiger tank. The Shermans also had a disturbing propensity to explode spectacularly when hulled, due to a combination of gasoline power and poorly designed ammunition stowage. In fact, British M4 crews had a slightly unflattering name for their lend-lease M4s — "Tommy Cookers".

M4A3/76

Weight: 31.1

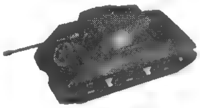
Hull Armor: 50/38/38

Turret Armor: 75/50/50

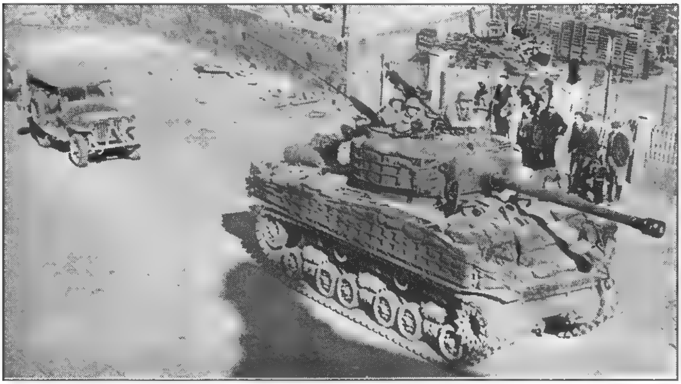
Main Gun: 76mm

Top Speed: 41.8

Crew: 5

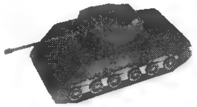


Like the tanks of the other major powers, the Shermans would find themselves increasingly overmatched by the advanced German tank models. By early 1944, the 75L40 was found to be ineffective versus the Panzerkampfwagen V and Panzerkampfwagen VI. In an effort to counter these advances, some Shermans were gradually improved with larger turrets and a more powerful, higher velocity 76L51 cannon. However, this change took place at a rate slower than what U.S. AFV crews would have liked (the slow rate of change was a result of doctrine overcoming reality in the minds of certain generals – probably ones who were not facing Tigers and Panthers in AFV vs. AFV combat). At the time of the Normandy invasion, only one of every four M4s was armed with the 76L51. At the end of the Second World War, roughly half of all M4s were armed with the 76L51. Some M4s were armed with a 105mm howitzer for dedicated anti-infantry work.



Liberators: Allied tanks with sandbag reinforced armor, parade through a French town on their way to Germany, 1945.

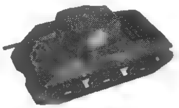
M4A3E8
Weight: 32.0
Hull Armor: 62/38/38
Turret Armor: 62/62/62
Main Gun: 76mm
Top Speed: 41.8
Crew: 5



This upgrading program necessitated further advances in suspension design, resulting in the M4A3E8 – also known as the "Easy Eight," which was distinguished by its "horizontal volute suspension system." The HVSS suspension featured a wider track and paired road wheels that better distributed the weight over the tracks. Later Shermans also featured "wet stowage" for ammunition to help reduce the fire hazard.

As the deployment of an American heavy tank (the M26 Pershing) would not take place until 1945, a special assault version of the Sherman tank was developed which featured greatly increased armor thickness. The armor on the M4A3E2 "Jumbo" Sherman was thick enough to have a chance of withstanding hits by the 75L70 of the Panther and the 88L56 of the Tiger. Jumbos were often placed as the lead AFV in a column, as they had a good chance of surviving the initial shots of an AT ambush. However, their mobility suffered as a result of the added armor weight. These were meant for close support of infantry in the assault against Axis fortifications. Although these were manufactured with the 75 mm gun, about one in six were field-upgraded to carry the more powerful 76 mm gun.

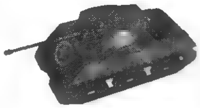
M4A3E2
Weight: 37.0
Hull Armor: 102/76/38
Turret Armor: 152/152/152
Main Gun: 75mm
Top Speed: 35.4
Crew: 5



The Sherman tank set high standards for reliability, mobility and ruggedness, giving it a prominent place in the history of World War II combat vehicles. The Sherman, like its counterpart the Panzerkampfwagen IV, was adaptable. There are still roughly 500 M4s still on active duty to this day with the militaries of several Nations. Their last great AFV vs. AFV Actions took place while they fought for the Israeli Army during the Arab-Israeli War. In PANZER COMMANDER five models of the Sherman are represented: the basic **M4A3 – Sherman** and its upgraded counterpart, the **M4A3/76**; the **M4A3E8 - Sherman "Easy Eight"** and an upgraded variant the **M4A3E8/76**; and the standard version of the **M4A3E2 - Sherman "Jumbo"**.

Approximately 3000 **M4A3 - Sherman** were produced between June 1942 and March 1945. They were armed with a 75L40 cannon and three machine guns (two .30 machine guns, one bow mounted and one coaxial, plus a .50 machine gun mounted on the commander's cupola). Armor varied from 38mm to 75mm in thickness, and the hull and turret were riveted. The preferred engine on all models of Shermans was the 500 HP Ford V-8 gasoline engine. Crew complement on this Sherman and all others was five men (commander, driver, gunner, loader and bow machine gunner) when available. In early 1944, as the 75mm gun became less effective versus the heavily armored German tanks, some Shermans were upgraded to carry a 76mm gun, in a variant known as the **M4A3/76**.

M4A3E2/76
Weight: 37.0
Hull Armor: 102/76/38
Turret Armor: 152/152/152
Main Gun: 76mm
Top Speed: 35.4
Crew: 5



By late 1944, the standard production M4 (which also fought on in the Korean War) was the **M4A3E8 "Easy Eight."** It had the improved HVSS suspension, a gyrostabilizer for its main armament (although most crews preferred not to use it), and was armed with a 76L51 as its main gun. It also had two .30 machine guns (one mounted coaxially, the other bow mounted). It's armor thickness ranged from 38mm to 62mm, and it had a cast frontal hull and a cast turret, which improved protection versus AP and HE shells. This was probably the best overall model of the M4 ever produced.

Between May and July of 1944, 254 **M4A3E2 Sherman "Jumbo"** were produced. The Jumbo saw its first combat action in September 1944. Its armament consisted of one 75mm M3 gun, and two .30 machine guns (one mounted coaxially, the other bow mounted). It's armor thickness ranged from 38mm to 152mm, and was well sloped. These were often field upgraded to carry a 76mm gun, in a variant know as the **M4A3E2/76**.

M24 Chaffee

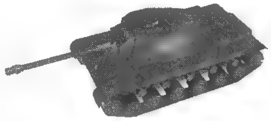
Light tanks have been a part of the American combat arsenal since the beginning of tank warfare, the chief advantage being that light tanks are easier to transport and can be more rapidly deployed. The M24 Chaffee represents the pinnacle of American light tank development through World War II. Appearing in 1944, the M24 replaced the earlier M3 and M5 Stuart models in American tank battalions and served for many years after the war. Though lacking the armor and offensive punch of the larger American tanks, the M24 was very fast for a tank and its 75 mm gun gave it very good hitting power for a tank of its class.

M24 – Chaffee
Weight: 17.5
Hull Armor: 25/25/13
Turret Armor: 25/25/25
Main Gun: 75mm
Top Speed: 56.3
Crew: 5

Approximately 4070 **M24 Chaffee** were produced between July of 1944 and June of 1945. They first saw action at the Battle of the Bulge (December 1944), and remained in service throughout the world until the late 70's. It was armed with a 75mm M6 anti-aircraft gun and two .30 machine guns (one coaxial and one bow mounted). It had twin Cadillac 44T24 petrol engines rated at 110hp each. It's armor thickness ranged from 10mm to 25mm, and was moderately sloped. Crew complement was usually five men (commander, driver, gunner, loader and bow machine gunner).

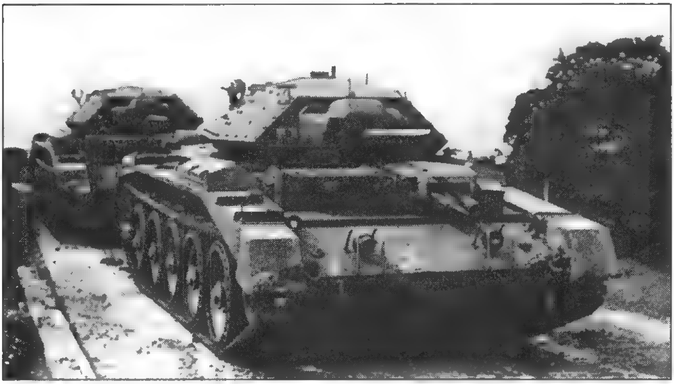
M26 Pershing

M26 – Pershing
Weight: 41.8
Hull Armor: 102/76/51
Turret Armor: 102/76/76
Main Gun: 90mm
Top Speed: 32
Crew: 5



The M26 had its gestation in a whole series of experimental medium and heavy tanks which were built during the early and middle stages of the war. The appearance of more advanced German tanks – most notably the Tiger – resulted in the desire for a tank with a more powerful 90 mm gun and armor capable of standing up to fire from the new German vehicles. Political differences between the Ordnance department and Army Ground Forces over the new tank design delayed the production and deployment of the M26. However, the Ardennes offensive, in which the U.S. 1st Army got pounded by German forces, highlighted the inadequacies of the Sherman tanks and cleared the way for deployment of the heavier Pershings. The 'Pershing' arrived in Europe in early 1945, almost too late to see service; five were present at the battle for the Remagen bridge, but were thought to be too heavy to be able to safely cross the damaged bridge. The M26 was an excellent AFV, but the war was basically over before it got a chance to prove this to its opponents. Perhaps the greatest achievement of the M26 was its role as the predecessor to the M60, one of the primary U.S. AFVs during the next 30 years, and which would continue in service with the U.S. Army and Marine Corps through the 1980's.

Approximately 700 **M26 Pershing** were produced between November of 1944 and November of 1945. The tank was low slung, with a silhouette lower than that of the M4. It was armed with a 90mm M3 anti-aircraft gun and three machine guns (two .30, one coaxial and one bow mounted, along with a .50 on the commander's cupola). It was powered by Ford GAF V-8 petrol engine, rated at 500hp. It's armor thickness ranged from 50mm to 105mm, and was extremely well sloped. Crew complement was five men (commander, driver, gunner, loader and bow machine gunner).



Crusaders in Europe: Early war British armor in France, 1940.

British Vehicles

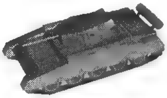
In spite of having invented the tank in World War I, England struggled throughout World War II to produce tanks of sufficient caliber and in sufficient quantity to counter the German threat. This resulted in the British acquisition of numerous American Grant and Sherman tanks and a whole series of 'hybrid' vehicles with American chassis and British armament. Nevertheless, British industry did produce some noteworthy vehicles like the Cromwell and Churchill tanks.

British tank production followed two general lines of development: the cruiser tanks which were originally developed from prototypes provided to England by American tank designer J. Walter Christie, whose designs also heavily influenced the Soviet tank industry; and the infantry tanks which were designed as close support vehicles for infantry operations.

Crusader Series

The British had several different classes of tank, each with its own intended duties and responsibilities. The A15 (hereafter referred to as the Crusader) was a 'Cruiser Tank'. Its job was to exploit breakthroughs, racing behind enemy lines and causing the collapse of an enemy's front by causing pandemonium in the enemy's rear areas with mobile attacks against artillery units, supply lines, headquarters, etc. The Crusader formed the backbone of British armored units until the arrival of American lend-lease AFVs during the campaigns in North Africa.

Crusader I
Weight: 19.3
Hull Armor: 40/27/30
Turret Armor: 40/30/30
Main Gun: 2pdr
Top Speed: 43.4
Crew: 5



When first introduced into Britain's arsenal, the Crusader had numerous problems with its transmission and engine, which caused frequent breakdowns. This was a result of the Crusader being rushed into active service in 1939 nearly straight from the drawing boards - not nearly enough testing time for an AFV of that era. When the Crusader first saw action - with the 6th Royal Tank Regiment of the 7th Armoured Brigade during *Operation Battleaxe* (the attempt to relieve Tobruk) in June of 1941, more Crusaders were lost to breakdowns than to enemy action.

An interesting feature on most Crusader I and a few of the early production Crusader II was a bow mounted machine gun mounted in a small 'sub turret'. Eventually, this sub turret was deleted from the design. It was often removed by Crusader crews and replaced with a field adapted bow mounted machine gun. The sub turret was poorly ventilated, cramped, and worst of all - difficult to escape from in an emergency - not a good thing when combined with a lightly armored AFV in combat.

Through 1941, its armor and main armament made it fairly competitive, however, by being limited to a 6-pounder (57L52) OQF cannon for its main armament, it basically became obsolete with the arrival of the Panzerkampfwagen IV Ausf F2. From early 1942 onward, it was already outmatched by the Panzerkampfwagen III Ausf J. The Crusader III and the Panzerkampfwagen III Ausf J had similar main armaments, but the armor protection of the Crusader III was inferior. Though the Crusader was fast and had a very low silhouette, it could not keep up with the gun/armor race and eventually disappeared from the front lines of battle.

Despite all the shortcomings mentioned above, the Crusader was a capable AFV until left behind by the advance of technology. It was the mainstay of the British armored divisions until mid 1942. With the arrival of the Grant, then the Sherman and the Cromwell, the Crusader was slowly phased out of service as a front line AFV. By late 1943, most had been replaced.

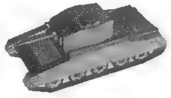
Between 1939 and 1942, Britain produced 4350 'Crusaders' (models I through III). In addition to the production figure stated, there were 1373 Crusaders built as special purpose variants - recovery vehicles, self propelled anti-aircraft vehicles, etc. Panzer Commander uses only the first Crusader.

Approximately 1300 **Crusader I** were produced between June 1941 to May 1943. It was powered by a Nuffield Liberty 12 cylinder engine rated at 340 HP. Armament consisted of a 2-pounder (40L52) OQF ("Ordnance, Quick Firing") cannon and two 7.92mm BESA MG (one mounted coaxially, the other in a bow sub turret, as explained above). Armor thickness varied from 5mm to 40mm with decent sloping. A fair number of rivets were used in the armor construction, which led to some problems in combat. Crew complement was five men (commander, driver, gunner, loader and bow machine gunner).

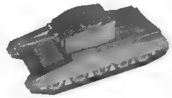
Cromwell Tanks

The Cromwell was numerically the most important British-built cruiser tank of World War II, forming the main equipment of British armored divisions in 1944-45 along with the Lend-Lease Shermans. For the first time, the British Army's armored divisions had an indigenous tank that they could rely on and put faith in. The Cromwell was an attempt to address many of the inadequacies of earlier Cruiser models. Heading the list of improvements were a better engine derived from the Rolls Royce Merlin aircraft engine, more armor protection and the more powerful 6-pounder gun.

Cromwell I
Weight: 28.0
Hull Armor: 76/51/51
Turret Armor: 76/51/51
Main Gun: 6pdr
Top Speed: 43.4
Crew: 5



Cromwell III
Weight: 28.0
Hull Armor: 76/51/51
Turret Armor. 76/51/51
Main Gun: 6pdr
Top Speed: 51.5
Crew: 5

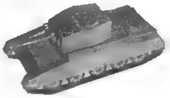


With the later addition of the even better Meteor engine, the Cromwell was the fastest and most powerful of British tank designs at the time, but the narrowness of the hull prevented its being upgunned further. Up till then the main armament gun had been required to be used in an anti-tank role, but experience in the desert and North Africa showed that after a breakthrough the main targets were not tanks but dug-in infantry and anti-tank guns. What was needed then was not an armor piercing gun but one that could also fire high explosive shells against these softer targets.

Although the 6-pounder was a big improvement over the 2-pounder employed in earlier tank series, it was still unable to fire a high explosive round, thus requiring the British forces to divert long-range artillery in support of tank operations.

Considerable redesign was necessary to remedy this situation. To provide a more powerful weapon in general, a new 75 mm gun was designed for use in British tanks which could use either AP or HE American ammunition from the Sherman tanks, and had the power to knock out a Tiger tank. The Cromwells from Mk. IV on were equipped with this gun.

Cromwell IV
Weight: 28.0
Hull Armor: 76/51/51
Turret Armor: 76/51/51
Main Gun: 75mm
Top Speed: 51.5
Crew: 5



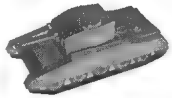
After the break out from Caen, the Cromwell was able to do the job it was designed for, pursuit and exploitation of the assault. Often the Cromwell squadrons outmaneuvered and outran the heavier German tanks, but were always outgunned. The Cromwell crews relied on their superior training to overcome this. Four models of the Cromwell are available in PANZER COMMANDER, the **I**, **III**, **IV** and **VII**.

Cromwell I was the original production model. Roughly 600 tanks were made and became available for service in December 1942. Crew complement was five men (commander, gunner and loader in the turret, driver and bow machine gunner in the hull). It was powered by a Rolls Royce Merlin aircraft engine. Armament consisted of a 6-pounder cannon and two 7.92mm BESA MG (one mounted coaxially, one mounted in the bow). Armor thickness varied from 51mm to 76mm.

The main difference between the Cromwell I and the **Cromwell III** was new Meteor engine that gave the Cromwell ample power and speed. About 200 tanks were made between 1943 and 1945.

About 70 **Cromwell IV** tanks were made available November 1943. Armament consisted of a dual purpose 75mm gun that could fire both AP and HE shot, and two 7.92mm BESA machine guns (one mounted coaxially, one mounted in the bow). The strong Meteor engine powered it. Its armor ranged from 51mm to 76mm in thickness. Crew complement was five men (commander, gunner and loader in the turret, driver and bow machine gunner in the hull).

Cromwell VII
Weight: 28.5
Hull Armor: 101/56/51
Turret Armor: 101/56/51
Main Gun: 75mm
Top Speed: 48
Crew: 5



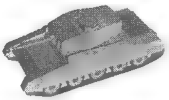
About 1500 **Cromwell VII** tanks were produced from June 1944 to June 1945. It was a reworked Cromwell IV. Main armament was the same dual purpose 75mm gun, and two 7.92mm BESA machine guns (one mounted coaxially, one mounted in the bow). The Meteor engine also powered the **Cromwell VII**, and it had wider tracks, a stronger suspension and a geared down drive to prolong the period between major services. Its armor was strengthened with appliqué plates welded on the hull front, thickness ranging from 50mm to 105mm. Crew complement was five men (commander, gunner and loader in the turret, driver and bow machine gunner in the hull).

A34 Comet

The British had an excellent anti-tank weapon in its 17-pounder, but production problems delayed its appearance in a British tank until the Comet appeared early in 1945, almost too late to participate in combat in the European theater. Nonetheless, the Comet was the first British tank that could approach the German Panther in terms of performance and firepower and is noteworthy for that reason.

The A34 Comet was the last of the Cruiser Tank series and was originally seen as being an improved Cromwell but ended up an almost total redesign. To avoid the need of widening the hull, as had been necessary with the A30 Challenger to take the 17-pounder gun, the British designed a new "compact" version of the 17-pounder with a shorter barrel, shorter breech, and lighter weight. This 77mm gun had a performance and penetrating power only slightly inferior to the 17 pounder gun and fired the same ammunition. The Comet proved a fast and reliable tank, the first British AFV to come near matching the German Panther in performance and gun power.

Comet
Weight: 35.8
Hull Armor: 101/50/50
Turret Armor: 101/50/50
Main Gun: 77mm
Top Speed: 46.7
Crew: 5



Approximately 1200 **Comets** were built between September 1944 to May 1945, and some stayed in British Army service until 1958, while tanks sold to other users were still going strong two decades later. The Comet did not enter combat until after crossing the Rhine in March 1945, though a few vehicles were issued earlier in December 1944. It was powered by a Rolls-Royce Meteor V12 engine rated at 600hp. Armament consisted of a 77mm gun and two 7.92mm BESA machine guns (one mounted coaxially, the other in the bow). Armor thickness varied from 50mm to 105mm. Crew complement was five men (commander, driver, gunner, loader and bow machine gunner).

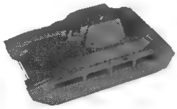
The Cromwell: The most numerous tank in British service, 1944.

Matilda II Infantry Tank

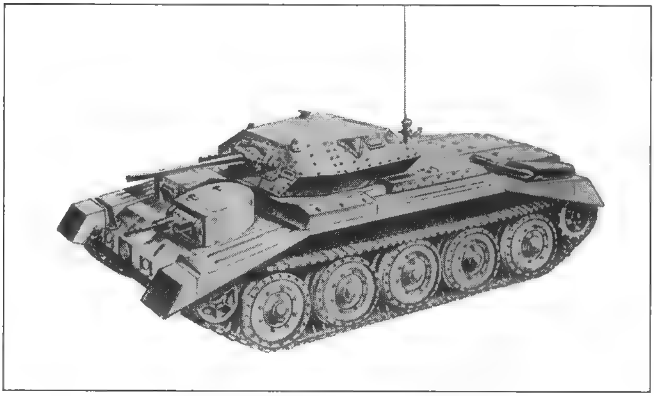
The British conceived the role of infantry tank as being distinct from that of the more maneuverable cruiser tanks. These vehicles would need to go no faster than walking pace, would be heavily armored and suitably armed for an infantry support role. The Matilda I, the original British infantry tank, mounted only machine guns but was capable of surviving under fire of the best German tanks of the day. Unfortunately the lack of an anti-tank weapon limited its tactical usefulness.

Thus, the British returned to the drawing board and developed the Matilda II, a much larger tank that mounted the 2-pounder gun. Its lack of speed, inability to be upgunned, and the lethality of the 88 eventually caused its demise, but despite its shortcomings, the Matilda II played an important role in the war in North Africa. It first saw action in June 1940, and was more than equal to the Italian tanks it faced in that campaign, being dubbed "Queen of the Battlefield." Unfortunately, the Germans arrived with their 88 mm Flak guns, which could easily defeat the Matilda's armor at long range. Worse, the Matilda II could not mount the larger British tank guns, so its importance declined and after 1942 it was used only in secondary roles. However, the Matilda can claim to be the only British tank that served and fought throughout World War II. The **Matilda II** is represented in PANZER COMMANDER.

Matilda Mk. II
Weight: 27.0
Hull Armor: 75/70/55
Turret Armor: 78/57/57
Main Gun: 2pdr
Top Speed: 22
Crew: 4



Between December 1937 and August 1943 2987 **Matilda II** were produced. It was powered by a twin AEC engines rated at 87hp each. Armament consisted of a 2-pounder gun and one 7.92mm BESA machine gun (mounted coaxially). Armor thickness varied from 50mm to 80mm; its thick hide and well protected tracks made it virtually indestructible to all but the German FlaK 88. Crew complement was four men (commander, driver, gunner and loader).

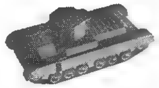


The Crusader: fast, well-armed, but unreliable.

Valentine Infantry Tank

The name Valentine derived from the date when the design was submitted to the British War Office, 14 February 1938. The Valentine began service in late 1940 and was actually used in the cruiser tank role due to the shortage of cruiser tanks available then. The Valentine had some of the same shortcomings as the Matilda – mainly low speed and an under-powered gun. It had one advantage over the Matilda, however, in that it could accommodate a larger turret and, hence, could be up-gunned to use the 6-pounder, thus ensuring a longer life span. The main drawback to the Valentine was that space inside the turret was restricted, allowing only a three man crew. The British 8th Army's employment of a few Valentine IX in March 1943 Tunisia was apparently their only use in action by the British. Almost half of the Valentine and its variants were sent to the Soviet Union. The **Valentine IX** is the model represented in Panzer Commander.

Valentine Mk. IX
Weight: 18.6
Hull Armor. 65/43/43
Turret Armor: 65/43/43
Main Gun: 6pdr
Top Speed: 24.1
Crew: 3



Approximately 630 **Valentine IX** were made. Its main gun was a 6-pounder, it had no machine gun. It was powered by a GMC diesel engine. Armor thickness ranged from 43mm to 65mm, and sloping was moderate. Crew was three men (commander-loader and gunner in the turret and driver in the hull).

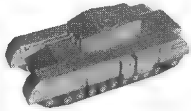
Churchill Infantry Tank

The A22 (hereafter referred to as the Churchill) was an 'Infantry Tank' – its job was to travel with infantry and provide direct fire support to them. Mobility was not really a requirement (in fact, the prototype was only required to have a maximum cross-country speed of 17 KPH). Heavy armor protection and a main armament with good anti-tank and anti-personnel capabilities were requirements. It would be nearly three years of hard development and redesign before the requirements were fully met, but in the end the Churchill has been regarded by many as one of the great AFVs of the Second World War. By 1943, the British had determined that their two class tank system ("cruiser" tanks - stressing speed over armor in their designs and used as cavalry was in the past, and "infantry" tanks – stressing armor over speed and used to fight alongside infantry and help achieve breakthroughs of the enemy's lines) was a flawed concept. The A27 ('Cromwell', effectively a 'heavy cruiser' tank) was becoming available and the Churchill appeared to reaching the end of its operational life.

But in Tunisia, the Germans retreated into the rugged and steep terrain of the Tunisian hills. The Churchill got a second chance, and that was all it needed. From the hills of Tunisia to the mountain passes of Italy to the marshes of the Netherlands to the dark and wet forests of Germany itself, the Churchill marked its place on the list of the most famous and effective AFVs of all time. When no tank could be mobile due to limits imposed by terrain, the Churchill was there alongside the infantry. It was tough enough to take almost anything the enemy could throw at it and armed with a dual purpose gun that could engage strongpoints or enemy armor. It was one of the first tanks ever able to engage German 88mm gun batteries and live to tell about it; Churchills killed the first "Tiger" killed by the British.

Churchill IV

Weight: 39.7
Hull Armor: 102/74/70
Turret Armor: 102/74/70
Main Gun: 6pdr
Top Speed: 24.9
Crew: 5



Due to its awesome armor protection and spacious interior, a number of Churchills were converted for use as engineer vehicles, bridgelayer vehicles, and flamethrower vehicles (these being called 'Crocodiles'). There are accounts of Churchill Crocodiles seeing action as late as the Korean war, and Churchill engineering vehicles were in service with the Irish army as late as 1970.

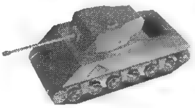
Between 1941 and 1945, Britain produced 5640 'Churchills' of one type or another. The Churchill IV is the model represented in PANZER COMMANDER.

Starting in mid 1942, 1622 **Churchill IV** were built. It had a cast armor turret, different from earlier models, designed to carry a new 6-pounder (57L52) OQF cannon. This new turret gave slightly inferior armor protection, but it was seen as a necessary evil to keep up in the gun/armor race. Crew complement was five men (commander, driver, gunner, loader and bow machine gunner). It was powered by a Bedford 21 liter 12 cylinder engine rated at 350 HP. Armament consisted of a 6-pounder (57L52) OQF cannon and two 7.92mm BESA MG (one mounted coaxially, one mounted in the bow). Armor thickness varied from 75mm to 130mm with almost no sloping. Armor protection was extremely good on all facings.

Sherman VC 'Firefly'.

When no other British built tank seemed capable, it was decided that the M4 Sherman (flying British colors) would carry the 17-pounder (76.2L58) cannon during and after the Normandy landings. There were many doubters of this conversion, but a prototype proved that only a small amount of change to the M4 Sherman was needed to make this possible. At this point, there was a great emphasis placed on conversion, so that by June of 1944 there was an average of one 'Firefly' per troop (platoon) of M4 Shermans in British armored units.

Firefly
Weight: 34.0
Hull Armor: 51/38/38
Turret Armor: 76/51/51
Main Gun: 17pdr
Top Speed: 40.0
Crew: 4

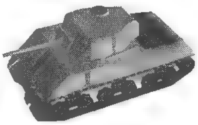


This was crucial. With the 17 pounder (76.2L58) the British now had a tank with a main armament that was superior to that of most German AFVs, and only slightly inferior to the weaponry of the Panzerkampfwagen V. It was primarily given the duty of 'overwatch' - staying hidden in cover and covering advancing British tanks with less powerful weapons as a main armament against attack by German Panzerkampfwagen V and Panzerkampfwagen VI. German Panzer crews had a healthy respect for the 17 pounder (76.2L58) armed Shermans - in Normandy they had orders to engage Fireflies first in any engagement.

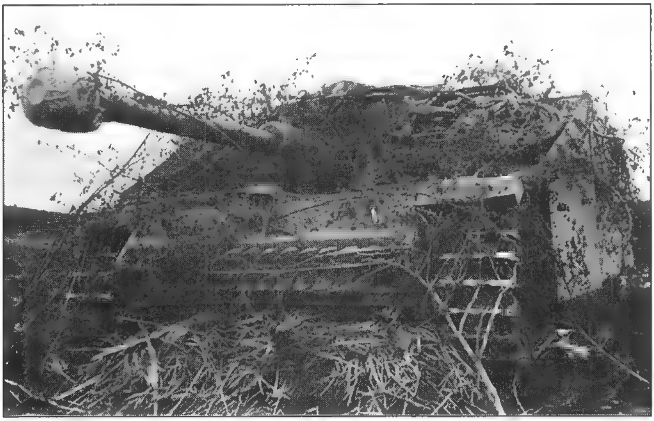
It is a common myth that German Panzer 'ace' Michael Wittmann died fighting a platoon of Fireflies'. In fact, his vehicle (along with himself and his crew) were killed when an aerial bomb scored a direct hit on the engine compartment of their Panzerkampfwagen VI Ausf E. The resulting fire detonated both the AFVs fuel and ammunition.

Between 1944 and 1945, Britain produced roughly 600 'Fireflies.' The 'C' designation for British AFVs represented a 17-pounder (76.2L58) main armament. The most common version of the Firefly was the VC (a converted Sherman V). It had armor ranging in thickness from 35mm to 80mm and was well sloped. Crew complement was four men (commander, driver, gunner and loader).

M4A4 – Sherman V
Weight: 32.2
Hull Armor: 50/38/38
Turret Armor: 75/50/50
Main Gun: 75mm
Top Speed: 40.0
Crew: 5



In addition to converting the Sherman V, these Lend-Lease AFVs were also used as is by British Forces. The United States sent Britain 7, 167 of the 7,499 **M4A4** produced (redesignated **Sherman V** by the British) which they became available in July of 1943. The Sherman V were actually inferior versions of their M4A3 cousins. While their armor was identical, with thicknesses ranging from 35mm to 40mm, the engine was inferior, resulting in a slower vehicle. In addition the turret was changed adding weight and it carried only a 75mm gun. With these disadvantages, it's no surprise that the British chose to upgrade some of their Sherman V to Fireflies!



The Last Line: A camouflaged assault gun waits for the Allies, Germany, 1945.

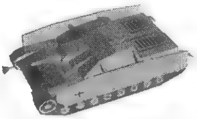
DESCRIPTIONS OF ENEMY ORDNANCE

This section is a catch-all, describing the capabilities and uses of enemy ordnance you are not able to control, such as tank destroyers and gun emplacements. Statistics are given for each vehicle as follows:

Name of the Ordnance
Hull Armor: (front/side/rear)
Turret Armor: (front/side/rear)
Main Gun: (ordnance type)
Top Speed: (in kilometers per hour)

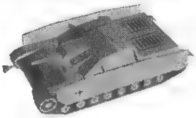
German Mobile Ordnance

StuG IIIB
Hull Armor: 50/30/30
Turret Armor: –
Main Gun: 75mm
Top Speed: 40



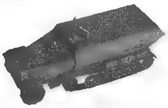
The Sturmgeschuetz was built on a PzIII chassis. The StuG III was cheaper and quicker to produce than turreted tanks, and their low height was helpful in ambushes. The StuG IIIB was used in assault gun and tank destroyer units.

StuG IIIG
Hull Armor: 50/30/30
Turret Armor: –
Main Gun: 75mm
Top Speed: 40



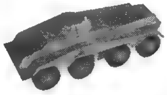
The StuGIIIG was almost identical to the StuGIIIB, however its gun was superior. Although it was the same size, it had a longer barrel that gave its shells increased penetrating capability.

251/1 Halftrack
Hull Armor: 15/8/8
Turret Armor: 10/8/8
Main Gun: 7.92mm
Top Speed: 50



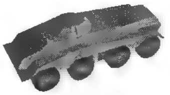
An armored semi-tracked vehicle, the 251/1 was designed as a troop carrier for the Panzer Divisions capable of accompanying tanks into battle.

SdKfz 231
Hull Armor: 15/8/8
Turret Armor: 8/8/8
Main Gun: 20mm
Top Speed: 85



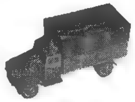
The Sonderkraftfahrzeuge 'Special Vehicle' 231 was an 8-wheeled armored car used as a reconnaissance vehicle with good cross-country mobility.

SdKfz 234/1
Hull Armor: 15/8/8
Turret Armor: 16/8/8
Main Gun: 20mm
Top Speed: 85



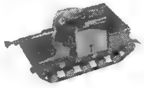
The Sonderkraftfahrzeuge 'Special Vehicle' 234/1 was also an 8-wheeled armored reconnaissance vehicle. It was an improvement over the earlier 231, with a better suspension improved off road performance, more space for ammunition and a more heavily armored turret armor.

Opel Blitz Truck
Hull Armor: 2/2/2
Turret Armor: –
Main Gun: –
Top Speed: 77.2



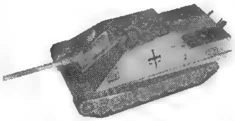
The main truck used by the German Army to move its troops and supplies by road

Marder
Hull Armor: 35/15/15
Turret Armor: 30/10/10
Main Gun: 75mm
Top Speed: 40



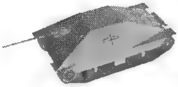
The Marder was a stopgap self-propelled anti-tank gun on a tank chassis made necessary by the Germans inability to stop the Soviet T-34 and KV tanks. Used mainly with Panzerjaeger (tank-hunter) detachments.

Jagdpanther
Weight: 45.5
Hull Armor: 60/40/40
Turret Armor: 80/50/40
Main Gun: 88mm
Top Speed: 46



The Jagdpanther was a heavy tank destroyer, and with its gun, armor, and speed, one of the deadliest. The Jadgpanther was issued to special units whose sole job was tank destroying.

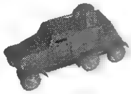
Hetzer
Hull Armor: 60/20/20
Turret Armor: 60/20/8
Main Gun: 75mm
Top Speed: 40



The Hetzer was a mobile anti-tank gun on a PzKpfw38(t) chassis and was used to replace the earlier Marders. The Hetzer was a very well-designed vehicle, it had a low and compact silhouette and the well-sloped armor provided good protection.

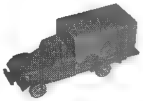
Soviet Mobile Ordnance

BA – 10
Hull Armor: 16/6/6
Turret Armor: 6/6/6
Main Gun: 45mm
Top Speed: 80



The BA-10 was an armored car with a light tank turret mounted on top. The BA-10 became the standard equipment of reconnaissance units as well as independent armored brigades.

Truck
Hull Armor: 2/2/2
Turret Armor: –
Main Gun: –
Top Speed: 77.2



Lend-Lease truck that had better off-road mobility than Soviet made trucks. One of the main trucks used by the Red Army to move its troops and supplies by road. Many locals thought the “USA” stenciled on the truck stood for “Ubiyat Sukinsyna Adolfa”, translated to “kill that @!*#?&#!@*% Adolf.”

Mission Accomplished: Soviet assault guns in Berlin, 1945.

SU – 85
Hull Armor: 45/45/45
Turret Armor: –
Main Gun: 85mm
Top Speed: 47

With the deployment by Germany of the new Panther and Tiger tanks, much haste was made by Soviet designers to produce a countermeasure. The designers were given the task of producing a self-propelled gun possessing high mobility, excellent armor-piercing capabilities, high rate of fire, and satisfying the requirements for rapid production. The SU-85 was this vehicle.

SU – 100
Hull Armor: 75/45/45
Turret Armor: –
Main Gun: 100mm
Top Speed: 48

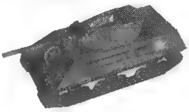
With the application of the 85mm gun to the T-34, it became necessary to increase the firepower of the self-propelled guns. The Soviets started to replace the SU-85 with the SU-100. The SU-100 proved to be an effective means of destroying German heavy tanks and tank destroyers - such as the Panther, Tiger, and Jagdpanther.

American Mobile Ordnance

M8 – Greyhound
Hull Armor: 16/10/10
Turret Armor: 19/19/19
Main Gun: 37mm
Top Speed: 88.4

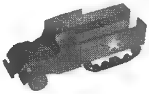
The M8 was designed as a light, highly mobile, armored reconnaissance car.

M36 – Jackson
Hull Armor: 38/19/19
Turret Armor: 75/32/102
Main Gun: 90mm
Top Speed: 48.3



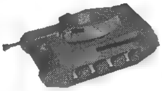
The M36 was designed to provide a more powerful self-propelled anti-tank gun than the M10 tank destroyer. The main advantage that the 90mm gun had over the 17-pounder was that it could fire twice as fast even though it could not penetrate as much armor as the 17-pounder.

M2 – Halftrack
Hull Armor: 6/6/6
Turret Armor: –
Main Gun: –
Top Speed: 64.3



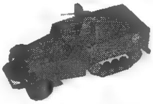
An armored semi-tracked vehicle, the M2's primary function was as a reconnaissance vehicle and a machine gun carrier.

M18 – Hellcat
Hull Armor: 13/13/13
Turret Armor: 19/13/13
Main Gun: 76mm
Top Speed: 80.4



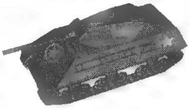
Incorporating the experience gained thus far, the M18 was a new tank destroyer designed to the principle of 'Shoot and Scoot', highly mobile, low-silhouette, and lightly armored. The open turret obtained better vision but at the expense of protection. It was the fastest tracked vehicle of the war.

M16 – Halftrack
Hull Armor: 6/6/6
Turret Armor: 6/6/1
Main Gun: Quad .50cal
Top Speed: 72.4



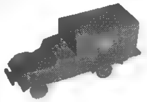
An armored semi-tracked vehicle, the M16 was a halftrack with quad .50 caliber machine guns mounted in the passenger area.

M10 – Wolverine
Hull Armor: 37/19/13
Turret Armor: 63/25/25
Main Gun: 3 inch
Top Speed: 48.3



A 3-inch gun mounted on a M4 tank chassis was designed for use against tanks and armored vehicles. It embodied heavy firepower, excellent mobility, and sloping armor. The main disadvantage was an open-topped turret which left the crew vulnerable to shell splinters and aircraft.

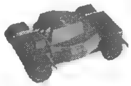
Truck
Hull Armor: 2/2/2
Turret Armor: –
Main Gun: –
Top Speed: 77.2



General Motors Corporation made this 4x4 truck used to move personnel and cargo.

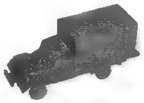
British Mobile Ordnance

Daimler Armored Car
Hull Armor: 16/8/8
Turret Armor: 16/8/8
Main Gun: 2pdr
Top Speed: 80



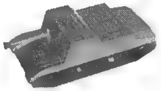
An armored scout car with a tank turret mounted on top that enabled the Damlier to look after itself on the battlefield.

Truck
Hull Armor: 2/2/2
Turret Armor: –
Main Gun: –
Top Speed: 77.2



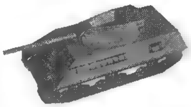
The Lend-Lease agreement sent many of these General Motors 4x4 trucks to Britain, where they were used to move personnel and cargo.

Sexton
Hull Armor: 40/35/35
Turret Armor: 27/18/18
Main Gun: 25pdr
Top Speed: 40.2



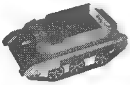
The Sexton was a self-propelled artillery gun designed and made in Canada to use the standard British 25pdr artillery gun.

Achilles
Hull Armor: 37/25/25
Turret Armor: 63/25/25
Main Gun: 17pdr
Top Speed: 48.3



In British service the M10 tank destroyer armament was replaced by a 17pdr gun.

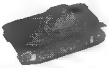
Bren Carrier
Hull Armor: 12/12/12
Turret Armor: 12/12/12
Main Gun: Light Machine Gun
Top Speed: 51



The Bren Carrier was a Universal Carrier mounting a Bren light machine gun. An armored tracked vehicle, the primary function was as a troop carrier.

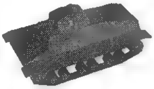
French and Polish Mobile Ordnance

Renault R-35
Hull Armor: 25/20/25
Turret Armor: 45/45/45
Main Gun: 37mm
Top Speed: 20



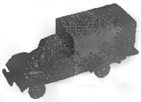
An early war light infantry support tank adequately armored and armed - but too slow. When war was declared this was the most numerous of all the French tanks. These tanks were also exported to the Poles at the start of the war.

Hotchkiss H-39
Hull Armor: 40/40/40
Turret Armor: 40/40/40
Main Gun: 37mm
Top Speed: 36



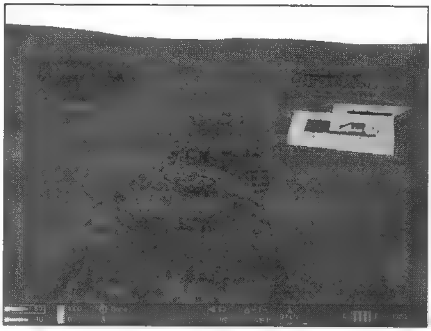
A light tank adopted by the French cavalry. With an upgraded 37mm gun, the H-39 was comparable to anything the Germans had at the time.

Truck
Hull Armor: 2/2/2
Turret Armor:
Main Gun:
Top Speed: 77.2



The French and the Poles had their own 4x4 trucks used to move personnel and cargo.

Stationary Gun Emplacements



Other than tanks and other mobile enemy units, in Panzer Commander you can also face dug in infantry units, wielding a variety of ordnance. All gun emplacements are housed in one of three types of bunkers: the standard square concrete bunker; a hexagonal concrete bunker, which allows for a greater range of fire; or the more vulnerable sandbag bunker. The firepower coming from these bunkers varies from nation to nation, but comes in one of three basic categories, machine guns, rockets and anti-tank guns. Although it is difficult to tell what a bunker is shielding by sight, pay attention to your information bar, a message appears there when the bunker has been identified by your men.

Machine Guns

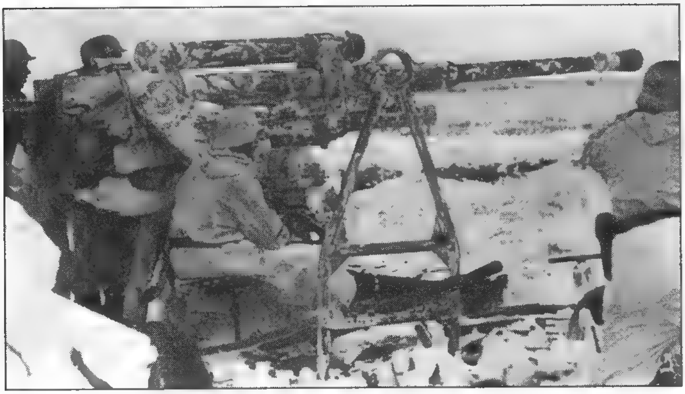
Machine gun emplacements are common, and every country has them, housed in one of the three kinds of bunkers. While generally ineffectual against your tank's armor, the noise from their attack can be annoying and distracting. Also, although machine guns may not be immediately dangerous, with repeated fire it is *possible* for them to damage parts of your tank such as the treads or the main gun. Tanks are often called upon to clear out machine gun nests, because of their near invulnerability; infantry and other vehicles you may be escorting can be destroyed by an overlooked emplacement.

Rockets

World War II also saw the development of anti-tank rockets, like the American "bazooka"and the more powerful German Panzerfaust. These fired short range, unguided missiles—really little more than grenades—carried a high-temperature explosive designed to melt through tank armor. Their limited range and accuracy made their use an act of great bravado. However, while their effectiveness generally is greatly diminished with distance, their weapons can wreak havoc at greater distances on poorly armored tanks, and other vehicles which you may be escorting. In Panzer Commander only the Germans and the Americans generally possess infantry emplacements armed with rockets.

Anti-Tank Guns

Tanks were such formidable weapons that all combatants in World War II put a great deal of emphasis on dealing with this threat. While it was common for each side to counter with tanks of its own, this was not always practical or appropriate, depending on the tactical situation. Defensive positions in particular were well suited for arming with less-mobile weapons, freeing tanks for those situations where their mobility could be used effectively.



Long arm of the Wehrmacht: The crew of an "88" scan the horizon for targets.

The primary anti-tank weapons were towed cannons which fired armor-piercing rounds—not unlike the main armament of most tanks. In fact, often tank main guns and anti-tank guns were designed around the same mechanisms and fired the same ammunition. Anti-tank guns were commonly employed in defensive emplacements, though an experienced gun crew could deploy one quickly enough in the field to respond to an immediate threat.

Like their motorized counterparts, anti-tank gun emplacements are capable of destroying your vehicle from a distance. Protected by the walls of their bunkers, these guns can pose a serious threat, that is best avoided when possible. The capabilities of anti-tank guns in PANZER COMMANDER are listed below by country.

German Anti-tank Guns

Throughout the war the Germans equipped their troops with a variety of anti-tank guns of increasing size. These had a significant impact on the early war successes of the Germans—especially in France and the Eastern Front, where the thicker armor of French and Soviet tanks made life difficult for the German Panzers.

PaK 38

A common early-war German towed weapon which fired a 50mm armor piercing round. This was a similar weapon to the KwK 39 employed in the Panzer III J, but somewhat more powerful.

PaK 39

Another towed weapon which was commonly used from the middle through the end of the war. This was a similar but more powerful weapon than the 75mm KwK 40 employed in the Panzer IV. The PaK 39 was also shoe-horned into the Panzer 38(t) chassis to form the Hetzer tank destroyer.

Flak 88

Originally designed as an antiaircraft weapon, the excellent ballistic characteristics of the feared "eighty-eight" made it a natural for anti-tank use, a role in which it would serve increasingly throughout the war. The Germans made several attempts to employ this weapon in an armored vehicle, the best of which were the Tiger tanks and the Jagdpanther tank destroyers.

Final Rest: Wrecked German armor 1945.

PaK 43
This was a version of the 88 designed to be more easily towed than the somewhat unwieldy Flak gun.

Soviet Anti-tank Guns

Although the Soviet tanks were more than capable of facing German armor, the Red Army deployed its own very effective anti-tank weapons to help fill the gaps.

ZIS-3 Anti-tank Gun
This gun made up the bulk of Soviet light field artillery through most of the war. It was a dual-role gun, capable of delivering both high-explosive and armor-piercing rounds with equal aplomb. Although the Soviets produced larger anti-tank guns, none achieved the success or level of deployment of the ZIS-3.

American Anti-tank Guns

Like the other combatants, American forces were equipped with a variety of anti-tank guns ranging in caliber from 37 to 90 mm, although the following made up the bulk of the American anti-tank armaments deployed in Europe and North Africa.

57 mm Anti-tank Gun
This was virtually a copy of the British 6-pounder and used the same ammunition. In fact, many were provided to the British armed forces under the Lend-Lease program. It was produced from 1942 to 1944, when production was halted due to its inadequacy against the latest German armor.

3-inch Anti-tank Gun
Originally designed as a light artillery piece, this weapon's ballistic characteristics leant itself well to anti-tank use and it was employed in that role from 1942 through the end of the war. This gun also appeared in slightly altered form in the M-10 tank destroyers.

British Anti-tank Guns

The British relied heavily on anti-tank guns to help counter the rapidly-improving German armor. The early 2-pounders were generally ineffective against German tanks in North Africa and British industry was slow to respond with improved weapons. Nonetheless, capable anti-tank weapons did find their way to British troops and the following are the best examples.

6-Pounder

This is the weapon from which the American 57 mm anti-tank gun was copied. These were first deployed in North Africa in 1941, but British industry had some difficulty producing them in quantity, leading to the requirement for the American version.

17-Pounder

Designed from the start as an anti-tank gun, the 17-pounder is recognized as one of the most effective British weapons of the war. Although several attempts were made to graft this gun onto an armored vehicle, it wasn't until 1944 when the Sherman "Firefly" and the Comet appeared that some success was achieved. Nevertheless, the 17-pounder served with distinction as an anti-tank gun from 1943 through the end of the war.

French and Polish Anti-tank Guns

The French anti-tank guns were also used by the Poles in defending against the German onslaught. The French weapons were generally effective against the German armor of the day, but the events of the war would halt their development before their full potential was realized.

47 mm Anti-tank Gun

Represents one of the several types of anti-tank weaponry available to the French and Polish during the early years of the war.

Airplanes

Airplanes are basically off-map artillery attacks that target a specific area and drop bombs on enemies. If the enemy tank is moving, then it is more difficult to hit. Airplanes can only be shot down in extremely rare circumstances.

KEYBOARD AND JOYSTICK COMMANDS

Keyboard Commands

The commands given below are the default. The configuration of your keyboard can be set from the Configure Keyboard screen in the Options Menu. Information about this screen can be found on page 25.

Movement

Increase/Decrease Throttle	Up/Down Arrows
Steer Tank Left/Right	Left/Right Arrow Keys
Apply Brakes	Delete
Reverse Direction	End
Set Throttle to Idle	~
Throttle Presets (1 is minimum, 0 is maximum)	1, 2 ... 9, 0

View Control

Rotate View Left/Right	Keypad 1/ Keypad 3
Elevate/Lower View	Keypad 7/ Keypad 9
Zoom View In/Out	Keypad +/-
Center View	C
Switch View to Next Vehicle in Platoon	V
Return View to Player's Tank	R
Chase View (default view until player changes view)	F1
Cupola View, Unbuttoned	F2
Cupola View, Binoculars, Unbuttoned	F3
Cupola View, Buttoned	F4
Driver's View	F5
Gunner's View	F6
Gunner's View, Magnified	F7
Machine Gunner's View (if present)	F8

Targeting and Fire Control

Traverse Current Weapon Left/Right	Keypad 4/Keypad 6
Elevate/Lower Current Weapon	Keypad 2/Keypad 8
Center Turret and Release Tracking	Keypad 5
Select Next Target	Tab
Select Previous Target	Caps Lock
Select Nearest Target	N
Select Target Centered in Gun Sight	S
Increase Range Finder Setting	Page Up (non-keypad)
Decrease Range Finder Setting	Page Down (non-keypad)
Fire Main Gun (or Machine Gun if in Machine Gunner's View)	Space Bar
Fire Coaxial Machine Gun	Left Control

Platoon Orders

Cycle Through Formations	F
Assign Selected Target to Platoon Member	Shift-1 or Shift-2
Hold Fire	H
Engage Enemy (Fire at Will)	E
Maintain Position	M

Crew Orders

Order Loader to Change Between AP and HE Rounds	G
Order Gunner to Track Target	T
Order Drive to Proceed to Next Way Point	A
Order Driver to Steer in Current View Direction	D

Miscellaneous

Exit Simulator	Escape

Joystick Commands

The commands given below are the default. The configuration of your joystick and other controllers can be set from the Configure Controller screen in the Options Menu. Information about this screen can be found on page 25.

Joystick Buttons

Fire Main Gun	Button 1
Toggle Main Gun Ordnance	Button 2
Fire Coaxial Machine Gun	Button 3 (if present)
Track Selected Target	Button 4 (if present)
Select Next Target	Button 5 (if present)
Switch Between Gunner and Previous View	Button 6 (if present)
Rotate/Elevate View (except when in Gunner's View)	Hat (if present)
Increase/Decrease Range Finder Setting (while in Gunner's View)	Hat (if present)

Joystick Axes

Configuration: 2-axis Joystick with no Throttle:

Steer Tank Left/Right	X-Axis
Throttle	Y-Axis

Configuration: 2-axis Joystick with Throttle:

Steer Tank Left/Right	X-Axis
Throttle Setting	Fixed Throttle Setting

Configuration: 2-axis Joystick with Throttle and Rudder Pedals:

Steer Tank Left/Right	Rudder Pedals
Throttle	Fixed Throttle Setting
Traverse Turret Left/Right	X-Axis
Set Main Gun Elevation	Y-Axis

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Each of our games undergoes extensive playtesting prior to its release. Through this process we hope to uncover and correct any errors in programming. However, due to the complex nature of our simulations, some program errors may go undetected until after publication. In addition to errors in the program, there are occasionally problems with the media itself.

Should you have defective media, please return the disk or CD only (keep all other parts of the game) to our Customer Support Department, along with a note describing the problem you have encountered. Replacement media will be provided upon our receipt of the defective media in accordance with Mindscape's warranty program as set forth in detail above.

QUESTIONS OR PROBLEMS?

If you encounter disk or system related problems you can reach us through several methods:

World Wide Web: www.ssionline.com (or the game's web page, which is listed in the manual)

Tech Support Fax: (415) 895-2113 **Attn. Technical Support**

Email: ssitechsupt@mindscape.com **(please list the game's name as the message's subject)**

Telephone: (415) 895-2626 between 8:30 A.M. and 5 P.M., Pacific Time, Monday through Friday, holidays excluded. NO GAME PLAYING HINTS WILL BE GIVEN THROUGH THIS NUMBER.

You can also write to us at: Mindscape, Inc., 88 Rowland Way, Novato, CA 94945, Attention: SSI Technical Support / Dept. 500 (include a self-addressed, stamped envelope for reply).

KEYBOARD COMMANDS

MOVEMENT

Increase/Decrease Throttle	**Up/Down Arrows**
Steer Tank Left/Right	**Left/Right Arrows**
Apply Brakes	**Delete**
Reverse Direction	**End**
Set Throttle to Idle	**~**
Throttle Presets (1 is minimum, 0 is maximum)	**1**, **2** ... **9**, **0**

VIEW CONTROL

Rotate View Left/Right	**Keypad 1/Keypad 3**
Elevate/Lower View	**Keypad 7/Keypad 9**
Zoom View In/Out	**Keypad + / -**
Center View	**C**
Switch View to Next Vehicle in Platoon	**V**
Return View to Player's Tank	**R**
Chase View (default view until player changes view)	**F1**
Cupola View, Unbuttoned	**F2**
Cupola View, Binoculars, Unbuttoned	**F3**
Cupola View, Buttoned	**F4**
Driver's View	**F5**
Gunner's View (2.5x)	**F6**
Gunner's View, Magnified (5x)	**F7**
Machine Gunner's View (if present)	**F8**

TARGETING AND FIRE CONTROL

Traverse Current Weapon Left/Right	**Keypad 4/Keypad 6**
Elevate/Lower Current Weapon	**Keypad 2/Keypad 8**
Center Turret and Release Tracking	**Keypad 5**
Select Next Target	**Tab**
Select Previous Target	**Caps Lock**
Select Nearest Target	**N**
Select Target Centered in Gun Sight	**S**
Increase Range Finder Setting	**Page Up**
Decrease Range Finder Setting	**Page Down**
Fire Main Gun or Machine Gunner's View	**Space Bar**
Fire Coaxial Machine Gun (if present)	**Left Control**

PLATOON ORDERS

Cycle Through Formations	**F**
Assign Selected Target to Platoon Member	**Shift 1**, **2**, or **3**
Hold Fire	**H**
Engage Enemy (fire at will)	**E**
Maintain Position	**M**

CREW ORDERS

Order Loader to Change Between AP & HE Rounds	**G**
Order Gunner to Track Target	**T**
Order Driver to Next Way Point	**A**
Order Driver to Steer in Current View Position	**D**

MISCELLANEOUS

Exit Simulator	**Esc**

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